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# OCEANOGRAPHY



**Moored Temperature Observations  
in JASIN**

by

L. M. deWitt, J. Bottero, W. V. Burt  
C. A. Paulson, and J. Simpkins

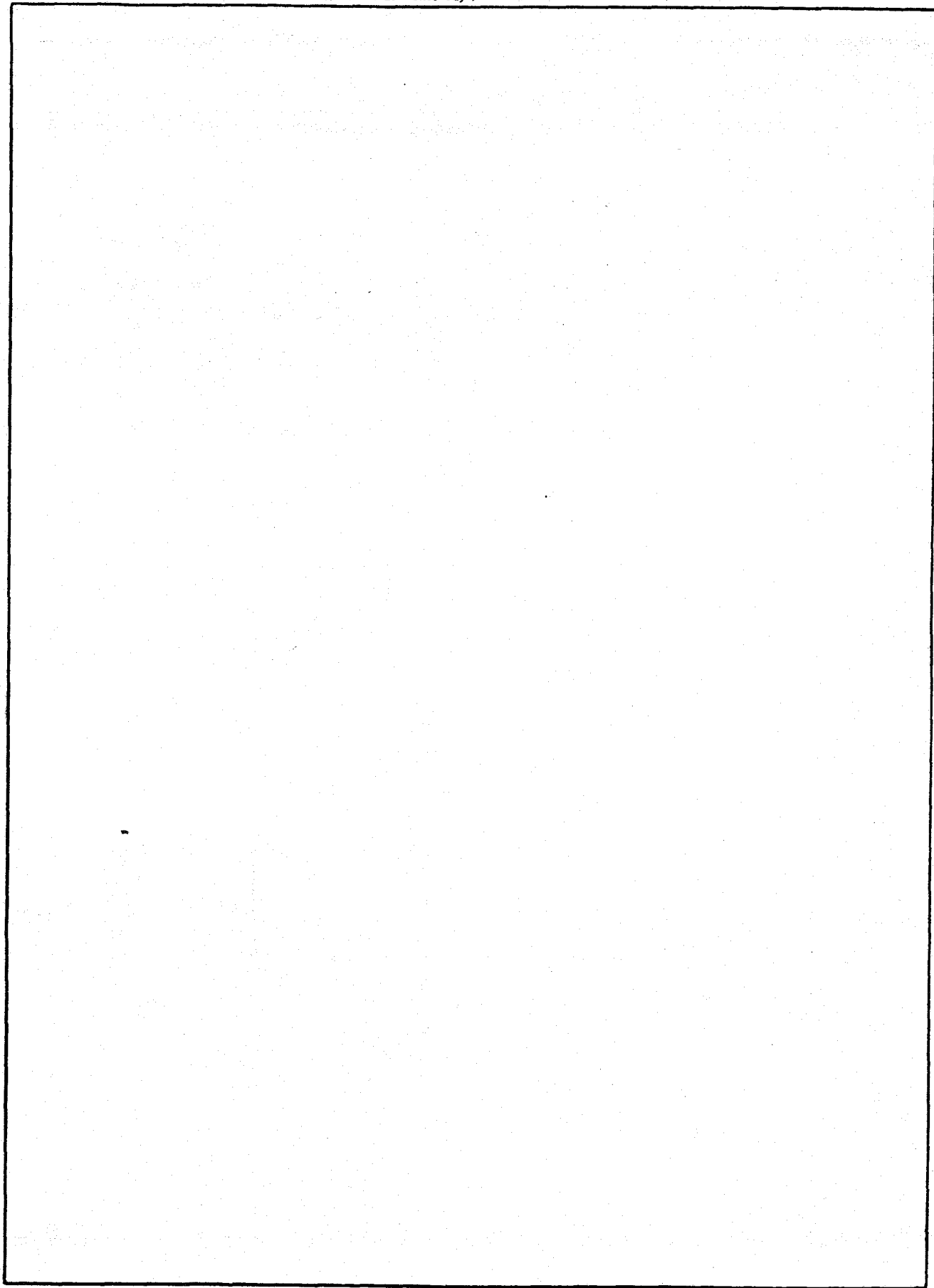
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August 1980

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)  Moored temperature observations were obtained at an array of buoys in the North Atlantic (59°00.2'-59°10.7'N, 12°27.4'-12°33.6'W) during the Joint Air-Sea Interaction Experiment (JASIN) of 1978. Observations were taken at 10-minute intervals by use of thermistors at 21 depths ranging from 4.5 m to 81.5 m. Plots of temperature as a function of time are presented for three moorings for the period July 28 through September 6, 1978.		



MOORED TEMPERATURE  
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DATA REPORT

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G. Ross Heath  
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## TABLE OF CONTENTS

ACKNOWLEDGMENTS-----	i
INTRODUCTION-----	1
INSTRUMENTATION-----	1
OBSERVATIONS-----	2
REFERENCES-----	3
APPENDICES	
A. Location of Buoys-----	4
B. Periods of Operation of Sensors-----	6
C. Temperature Observations at B1-----	10
D. Temperature Observations at B2-----	48
E. Temperature Observations at B4-----	89

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We gratefully acknowledge the cooperation of the officers, crew and scientists aboard the R/V ATLANTIS II, David F. Casiles, commanding and Melbourne G. Briscoe, Chief Scientist. Special thanks go to personnel from the Woods Hole Buoy Group for their aid in deployment and retrieval of the moorings. This research was supported by the Office of Naval Research through contracts N00014-76-C-0067 and N00014-79-C-0004 under project NR 083-12.

## INTRODUCTION

This report presents moored temperature observations obtained at three buoys during the Joint Air-Sea Interaction Experiment (JASIN) of July through September 1978. Details of the JASIN project can be found in reports of the Royal Society (1977, 1978) and in a paper by Pollard (1978). In the present study, temperature was recorded at 10-minute intervals at depths ranging from 4.5 m to 81.5 m. Sea surface temperature and atmospheric conditions were also recorded at each buoy but will not be presented in this report. For a discussion and analysis of these observations, see Ishida (1980). Temperature observations using a towed thermistor chain have been obtained by Baumann et al. (1980) in the same general area as the moorings.

## INSTRUMENTATION

The location of the four moorings B1 through B4 is given in Appendix A. The moorings each included two Aanderaa recorders and thermistor chains. At moorings B2, B3 and B4, eleven thermistors on shallow chains measured water temperature at vertical separations of 3 m from a depth of 5.5 m to 35.5 m. A loop in the cable at mooring B1 caused the shallow chain at this mooring to be 1 m more shallow than at the other three, so observations there were at vertical separations of 3 m from 4.5 to 34.5 m. The deep thermistor chain at all four moorings measured water temperature at 10 locations separated by intervals of 5 m from a depth of 36.5 to 81.5 m. The eleventh channel on the deeper chains was used to record pressure, but because of an apparent sensor malfunction, pressure observations have not been included in this report.

## OBSERVATIONS

The starting time and length of operation of each thermistor is given for buoys B1, B2, and B4 in Appendix B. Observations from buoy B3 were extremely noisy and have been excluded from this report. Temperature observations for the remaining three moorings as a function of time are given in Appendix C.

In general, the temperature plot from a given sensor was terminated at the point in time where it appeared to fail. In some cases, however, the exact location of the cutoff point was difficult to determine because the sensor apparently began giving erroneous readings several hours or even days before it totally failed. One obvious example of this occurred at mooring B1. The 4.5 m thermistor seemed well correlated with the lower sensors during the first six hours of its operation, but at about 0100 on August 2 higher frequency oscillations ceased. While the observations continued to follow the general trend of the lower sensors, inversions appeared that were probably not real. Even so, these observations give an approximate indication of surface temperature at B1 and have not been excluded from the plots. Other examples of this occurrence are of much shorter duration but in most cases are just as obvious.

One other problem with the data is that except for a few instances, the data loggers would not record lower than a certain value which was approximately  $8.9^{\circ}\text{C}$ . This malfunction appeared most obviously in frequent sharp cutoffs of the lower two sensors in the last three weeks of data from mooring B4. (For example, see August 17). The problem also occurred occasionally at B2 when temperatures fell low enough. Temperatures at B1 never fell below  $9.09^{\circ}\text{C}$  and no such cutoffs appeared.

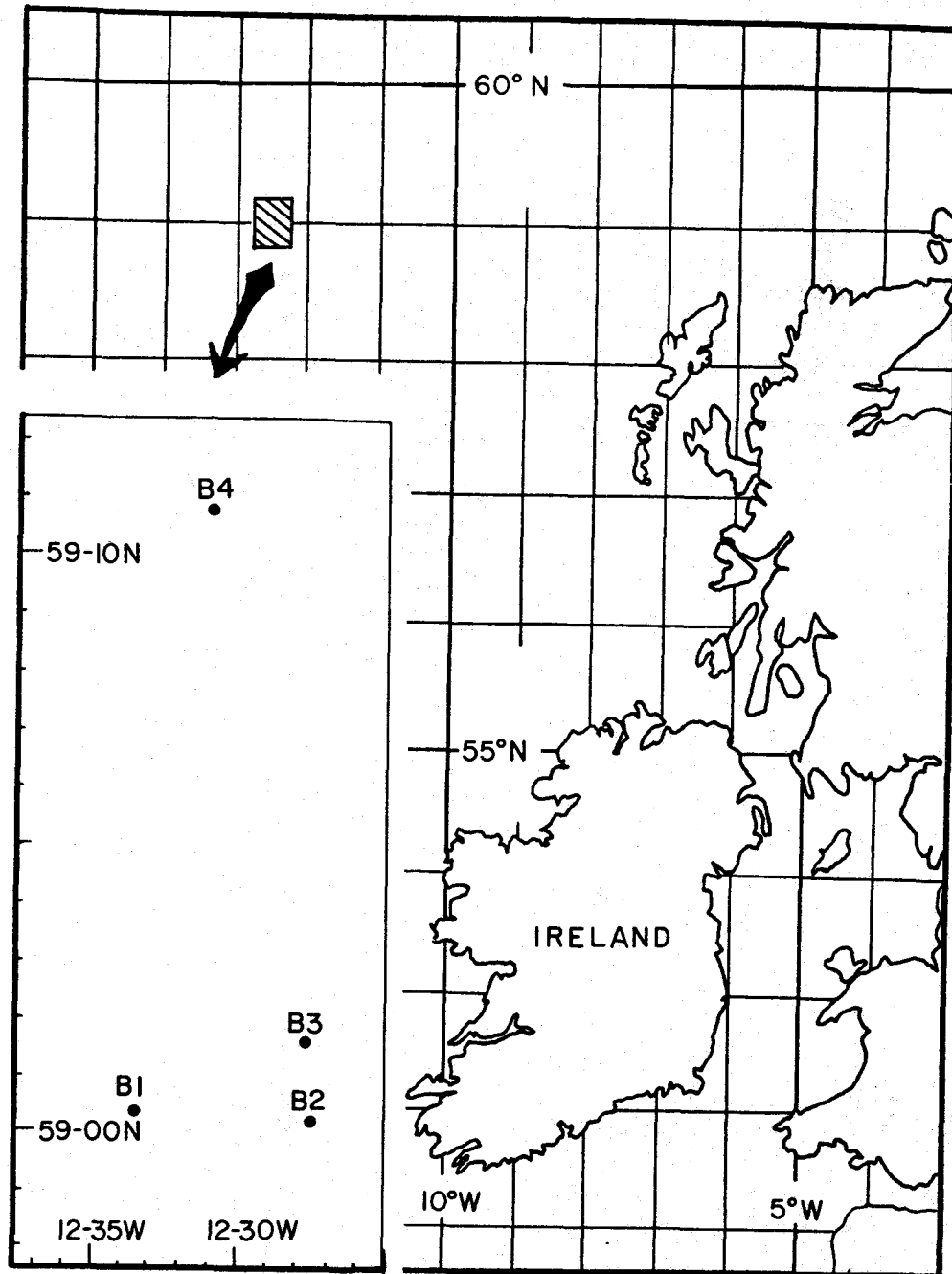


## REFERENCES

- Baumann, R. J., C. A. Paulson and J. Wagner, 1980: Towed thermistor chain observations in JASIN. Report, Reference 80-14, School of Oceanography, Oregon State University, Corvallis, Oregon 97331, 202 pp.
- Ishida, H., 1980: Analysis of Meteorological Observations from an Array of Buoys during JASIN. Report, Reference 80-2, School of Oceanography, Oregon State University, Corvallis, Oregon 97331, 63 pp.
- Pollard, R. T., 1978: The Joint Air-Sea Interaction Experiment-JASIN 1978. Bull. Amer. Meteor. Soc., 59, 1310-1318.
- Royal Society, 1977: Air-Sea Interaction Project, Scientific Plans for 1977 and 1978. London, 208 pp.
- Royal Society, 1978: Air-Sea Interaction Project, Operational Plans for 1978, London, 225 pp.

## APPENDICES

APPENDIX A  
Location of Buoys

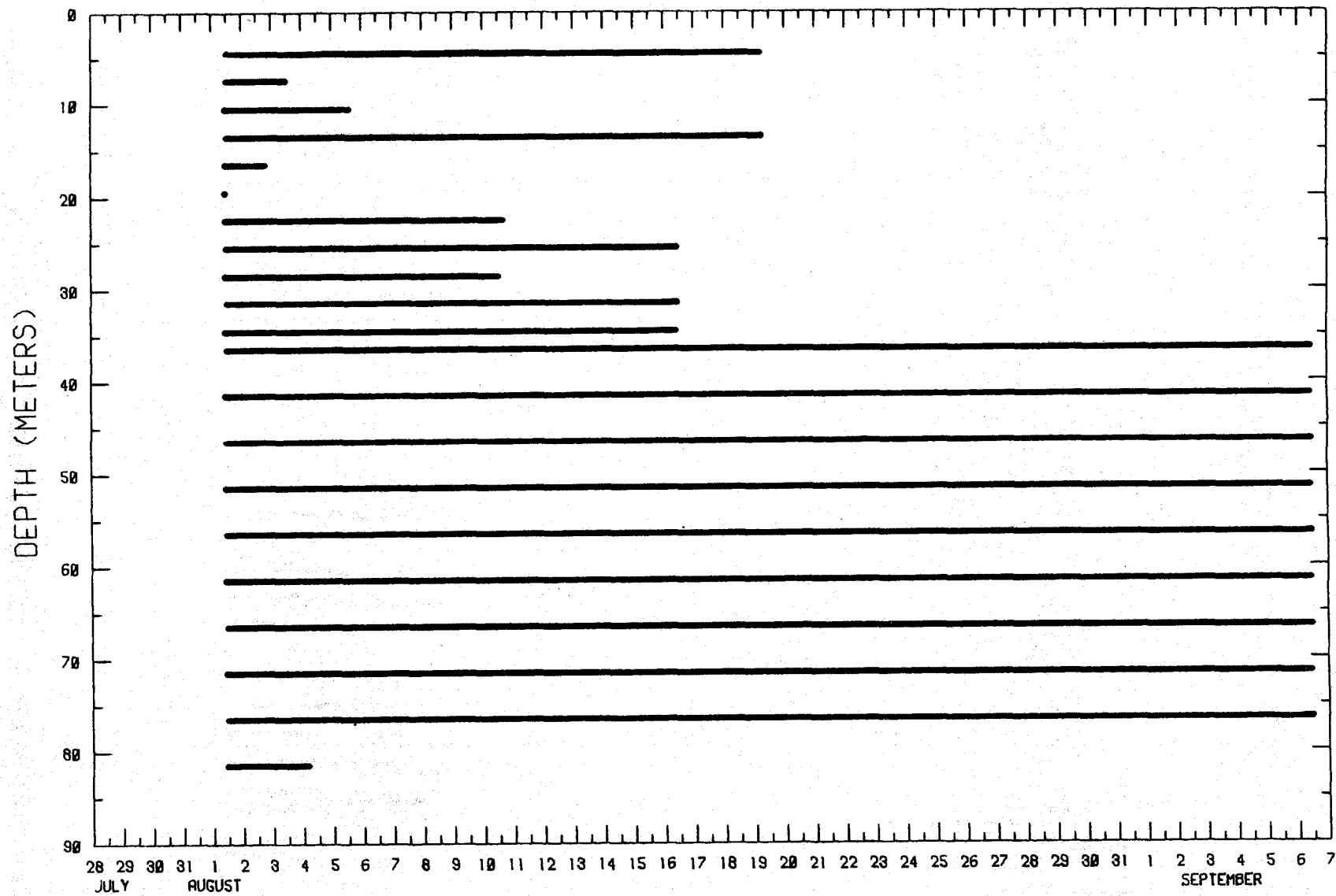


Location of Buoys

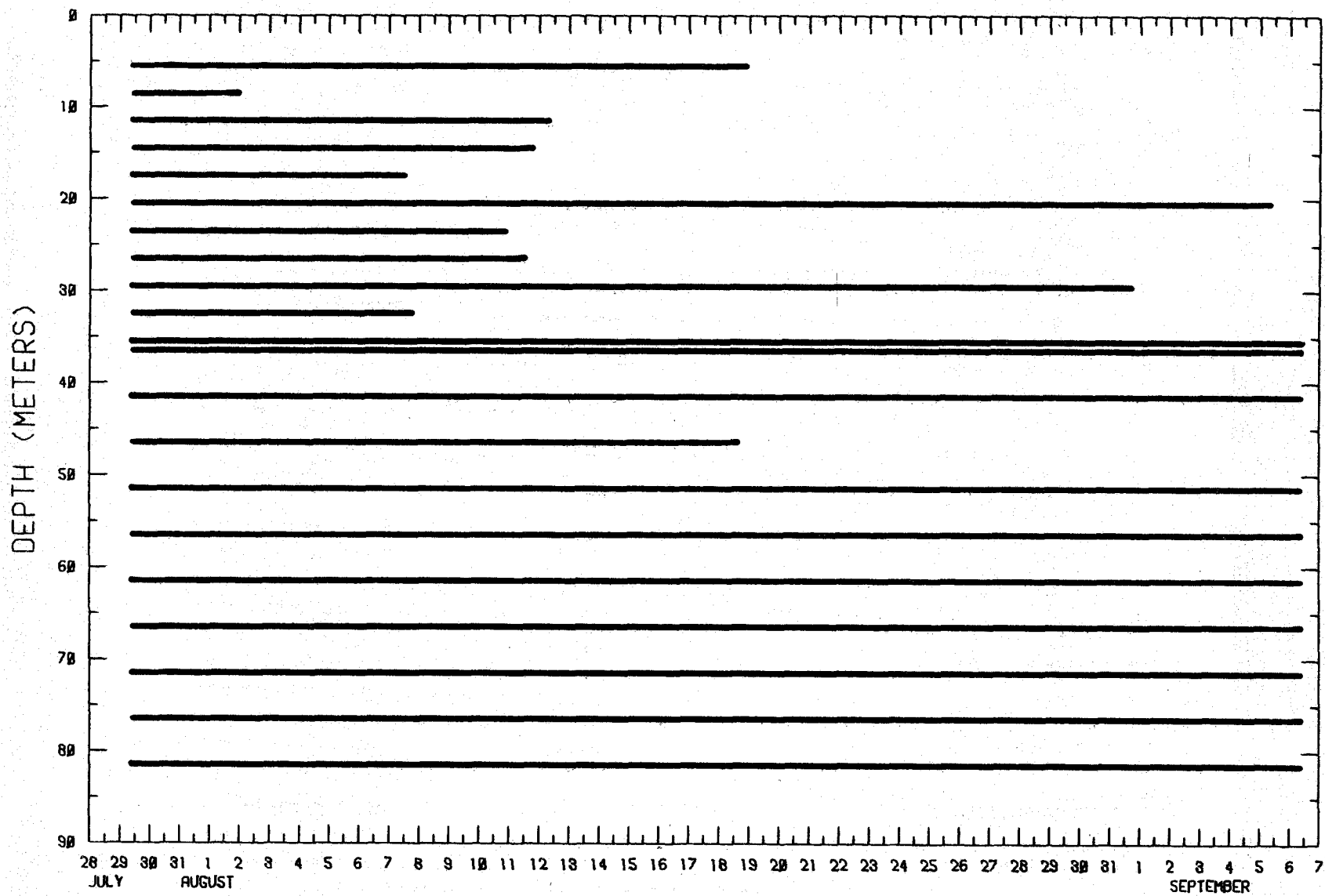
	Lat (N)	Lon (W)
B1	59°00.4'	12°33.6'
B2	59°00.2'	12°27.5'
B3	59°01.6'	12°27.4'
B4	59°10.7'	12°31.0'

## APPENDIX B

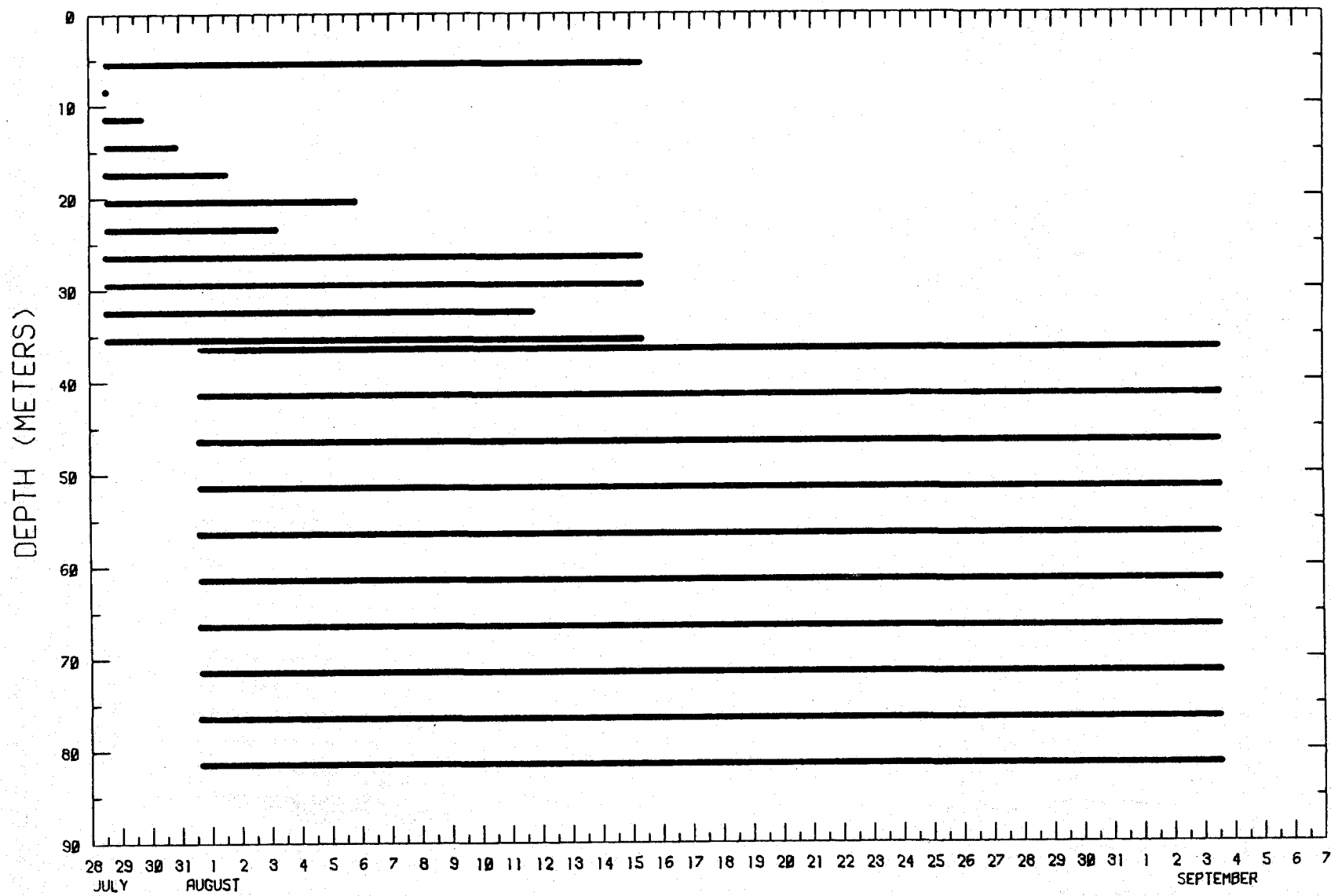
Depth versus the duration of operation of each sensor at buoys B1, B2 and B4 are given on the following three pages.



DURATION OF THERMISTORS DEPTH VS TIME MOORING B1



DURATION OF THERMISTORS DEPTH VS TIME MOORING B2

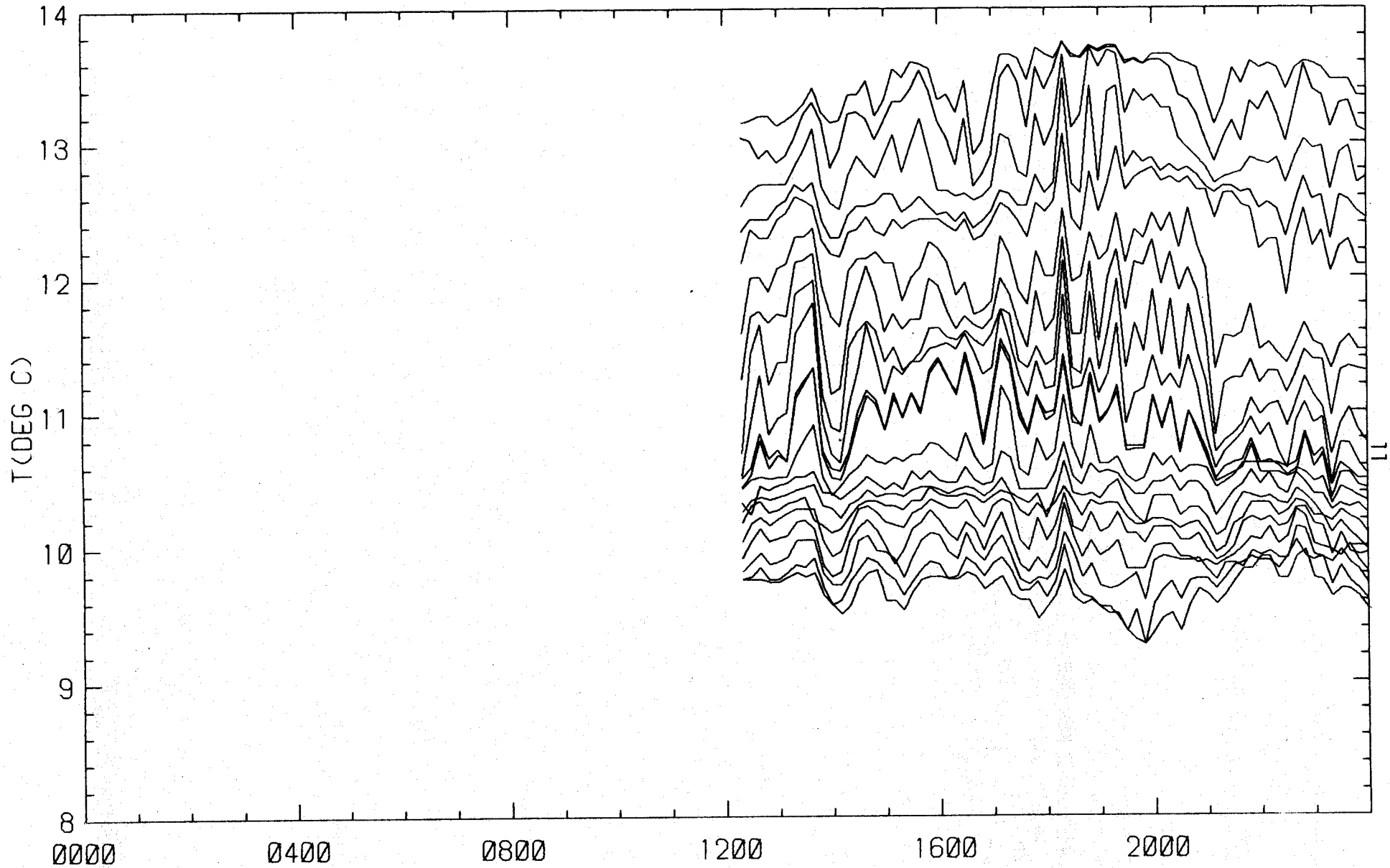


DURATION OF THERMISTORS DEPTH VS TIME MOORING B4

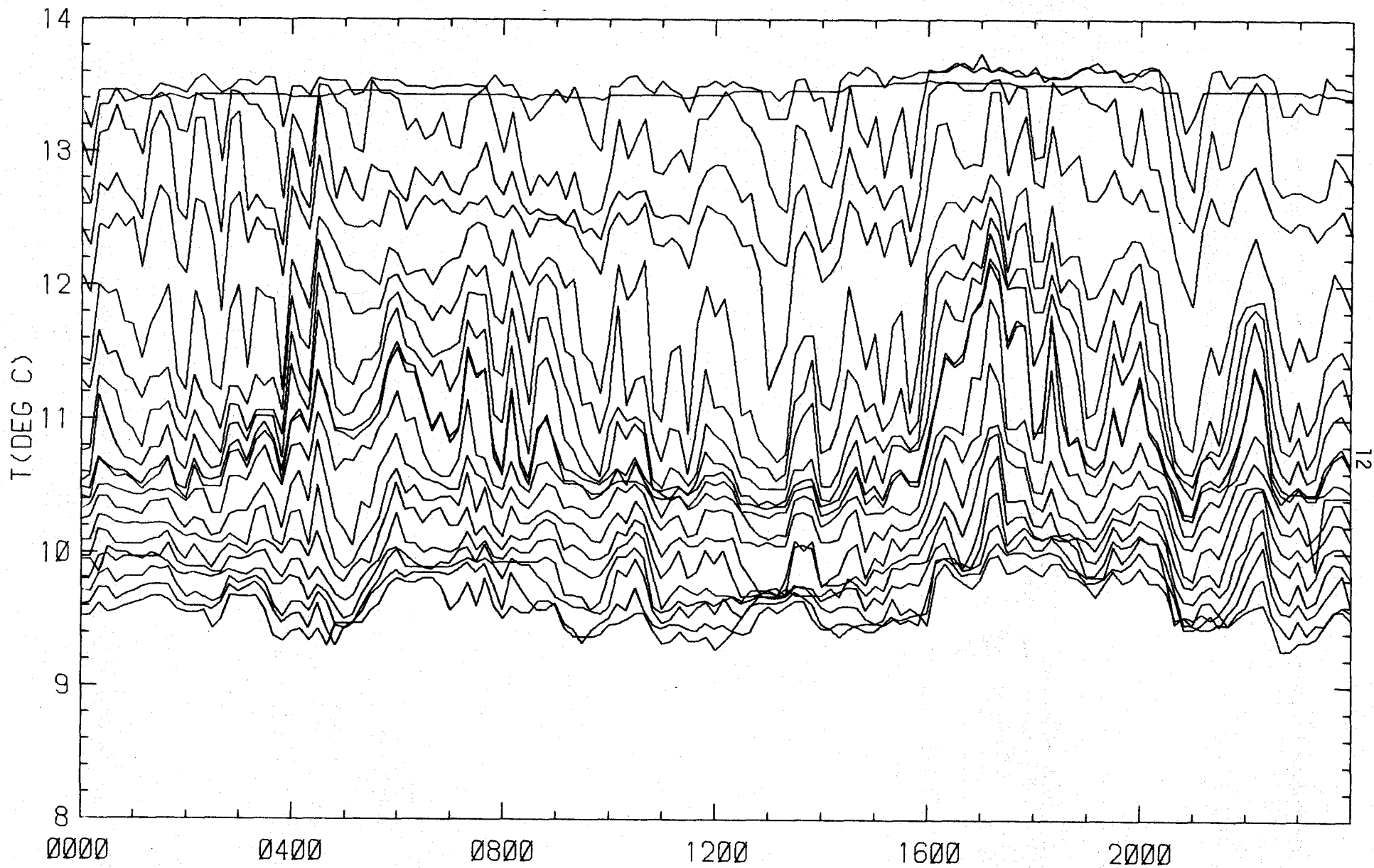


APPENDIX C

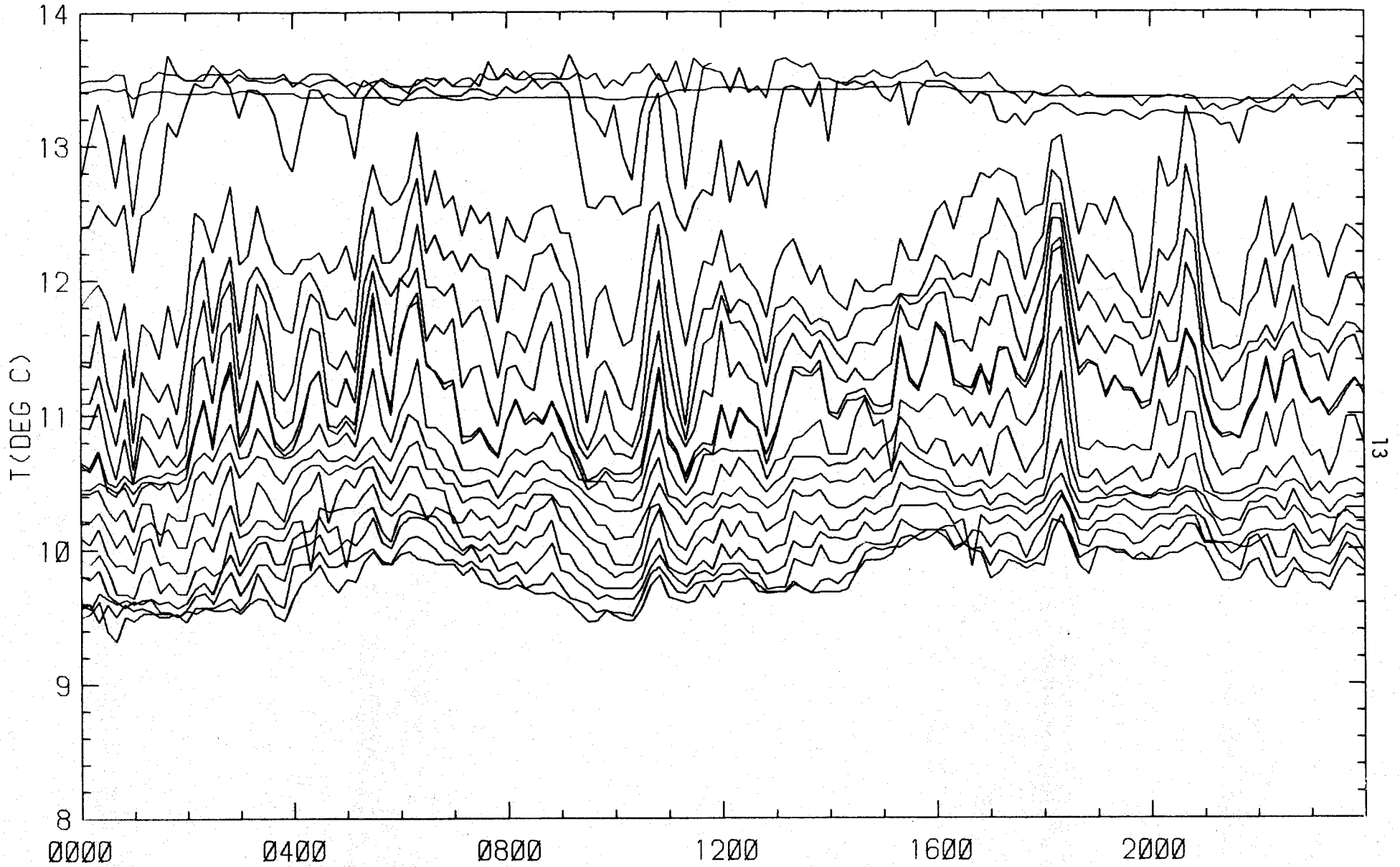
Temperature Observations at B1



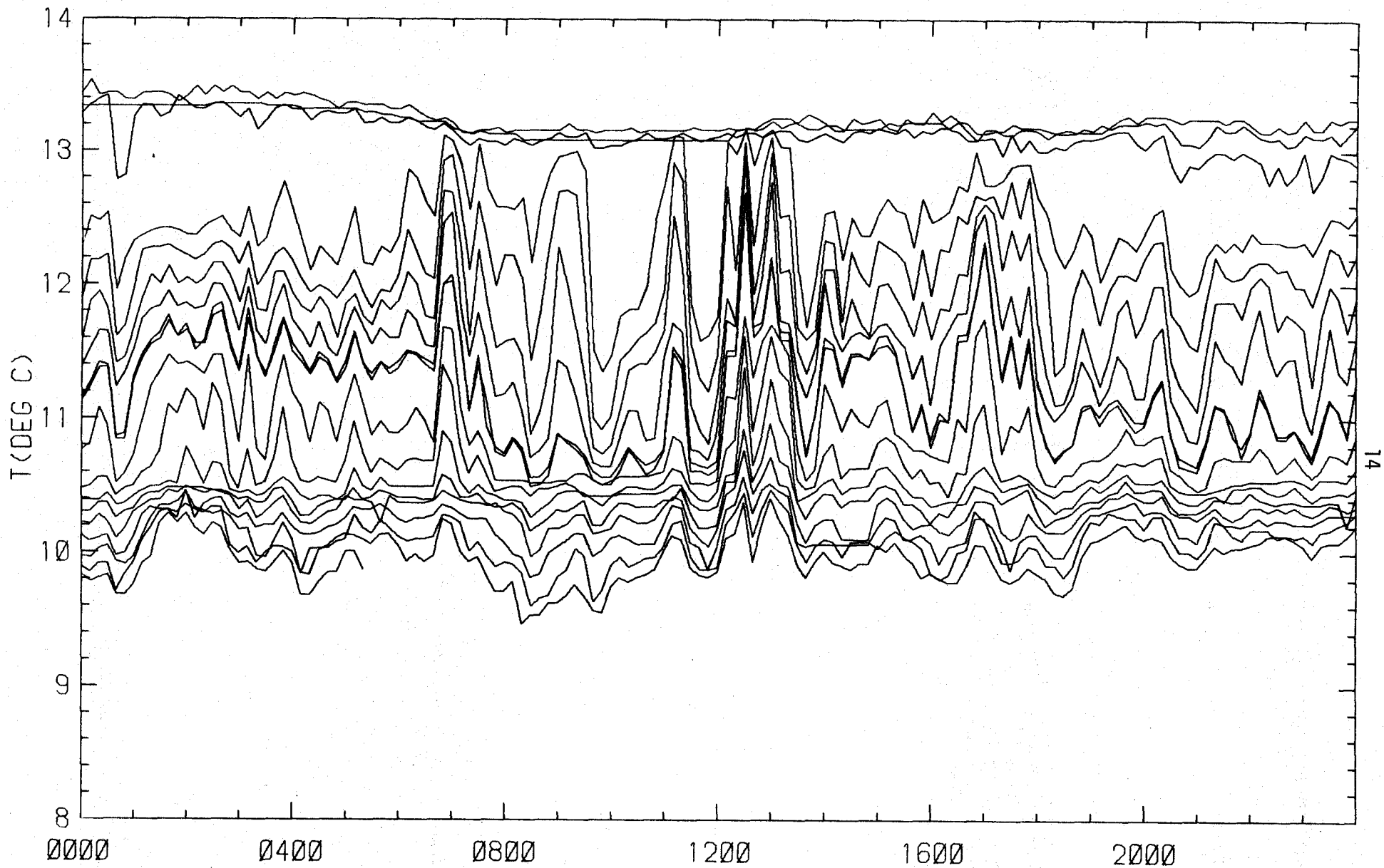
MOORING B1 TEMP VS TIME 1 AUG 78



MOORING B1 TEMP VS TIME 2 AUG 78

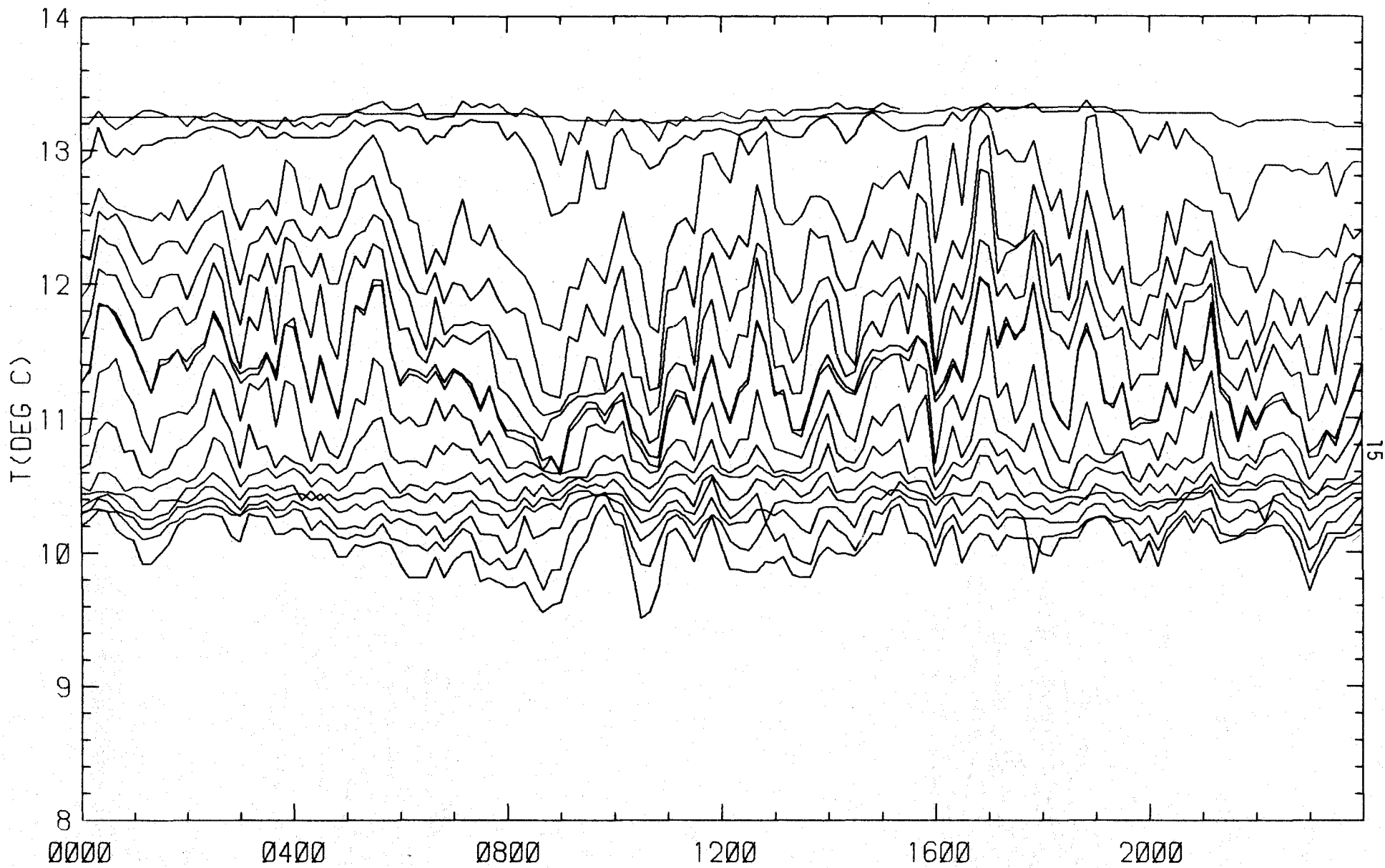


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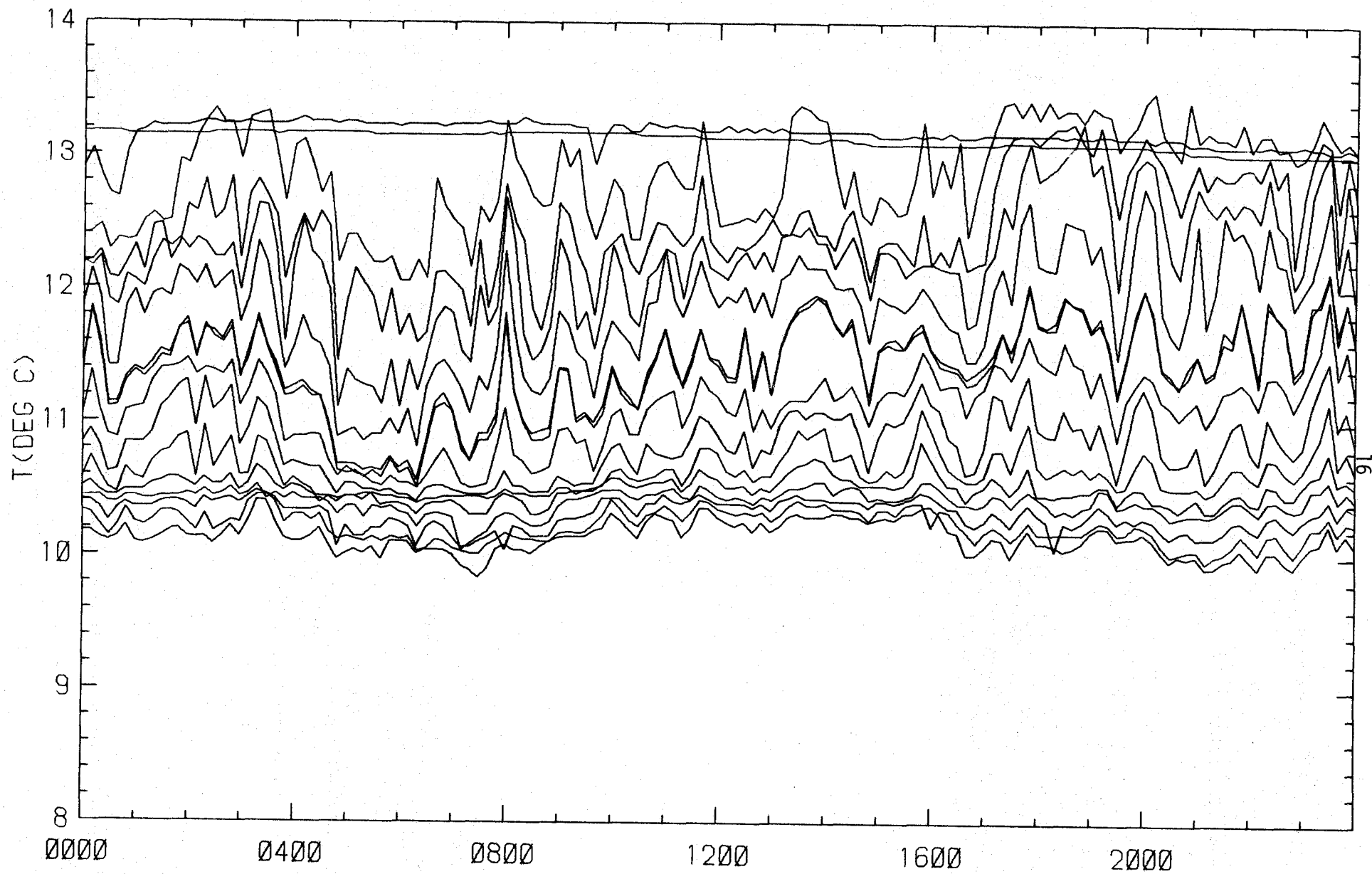
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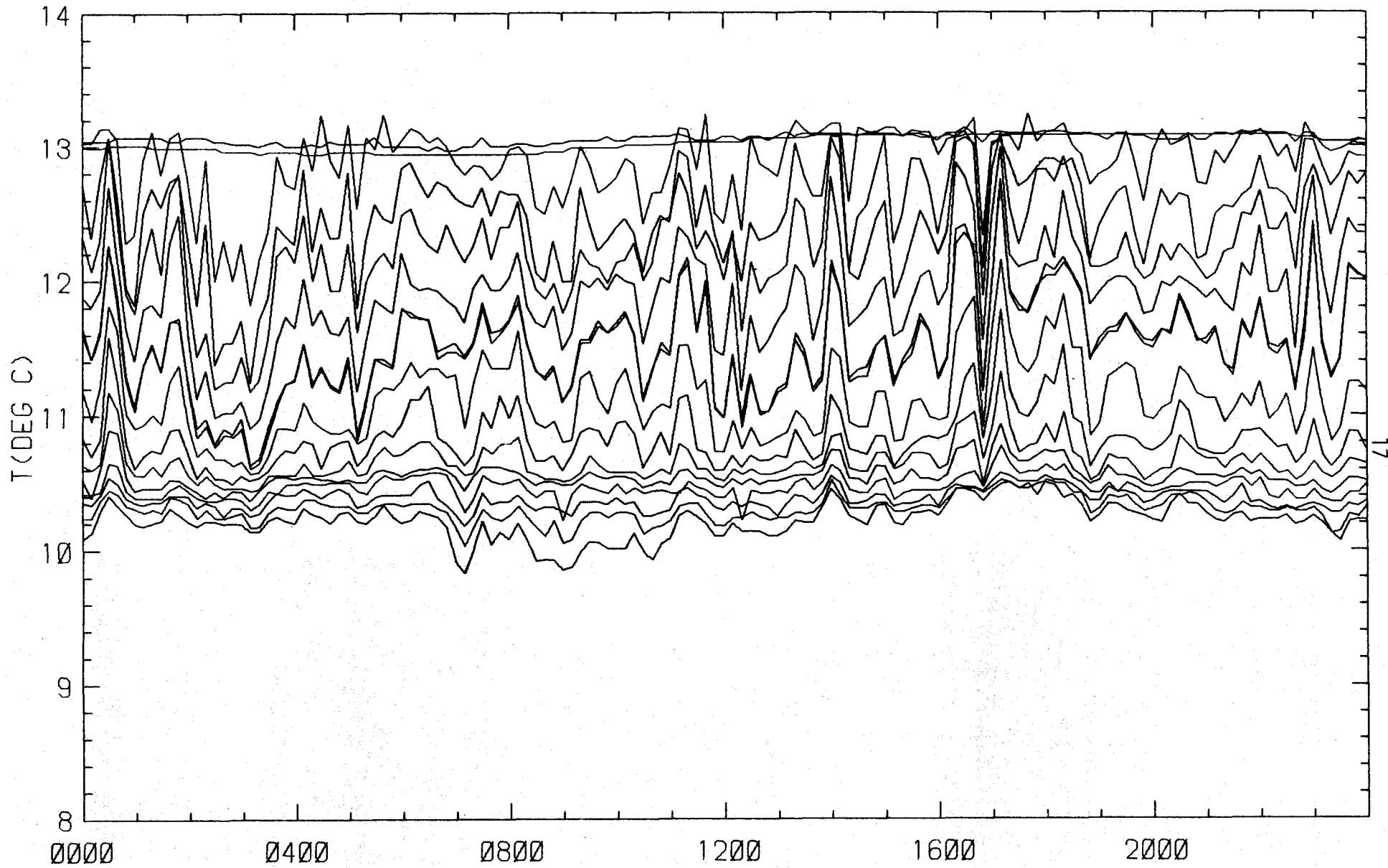


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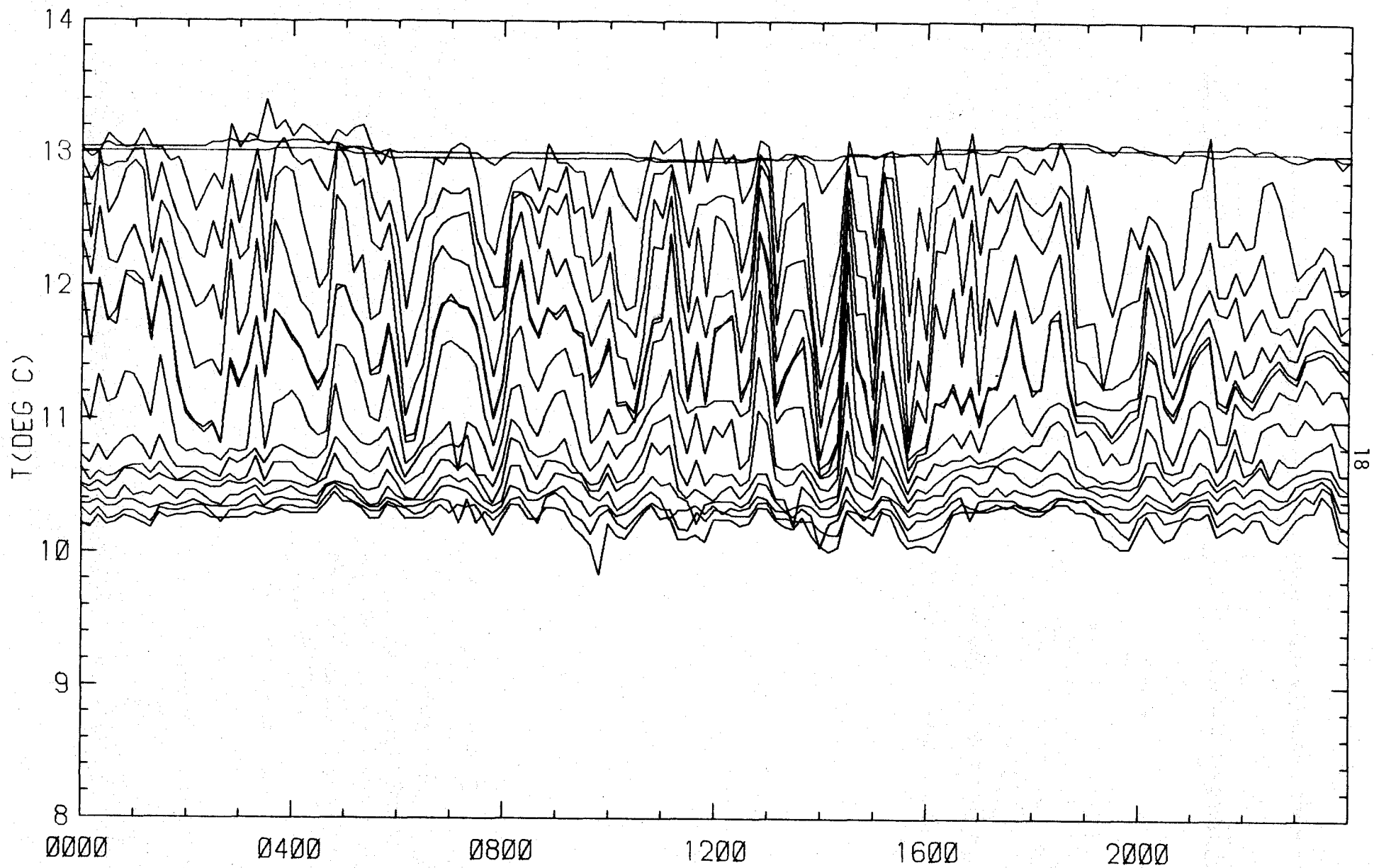


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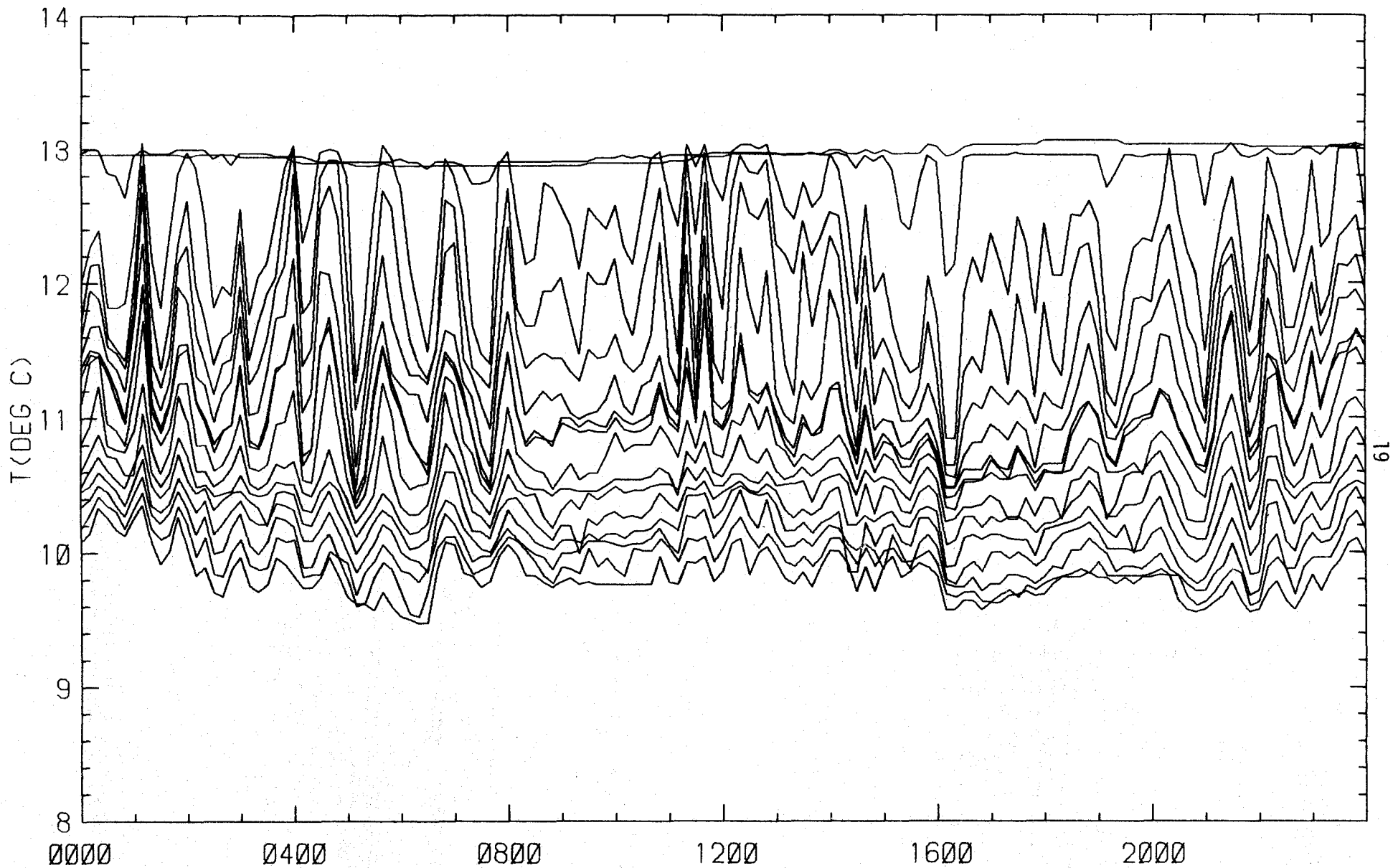


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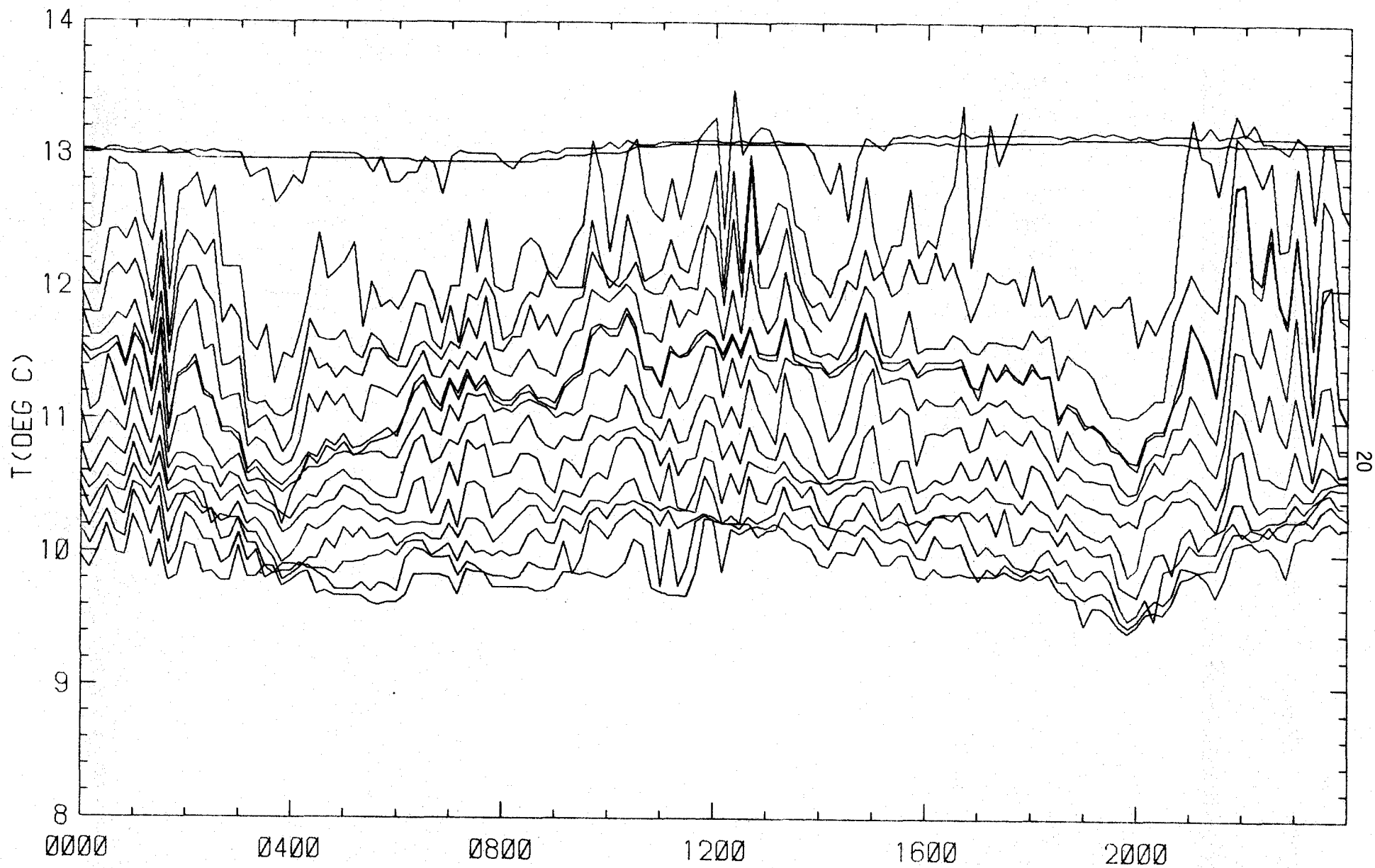




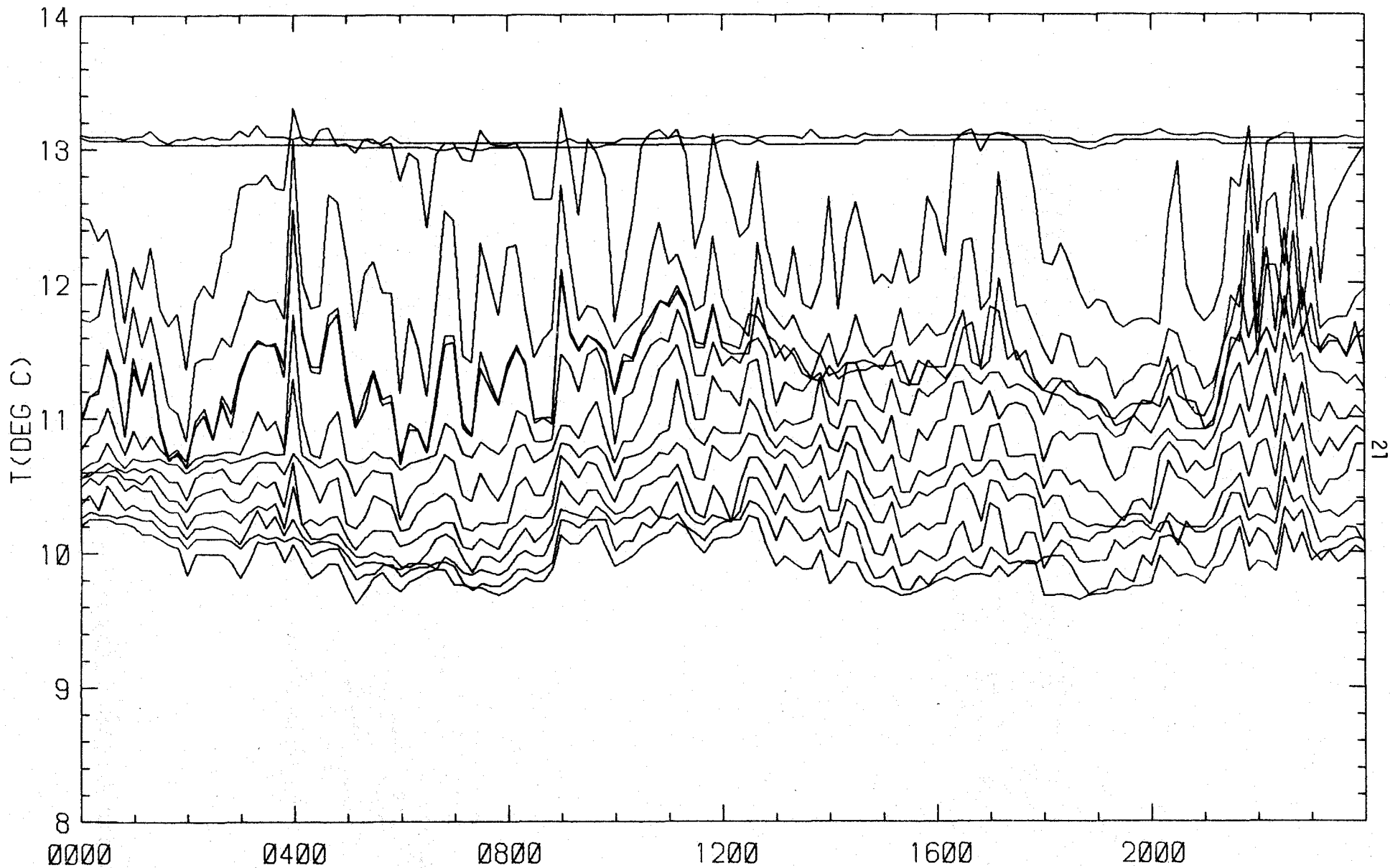
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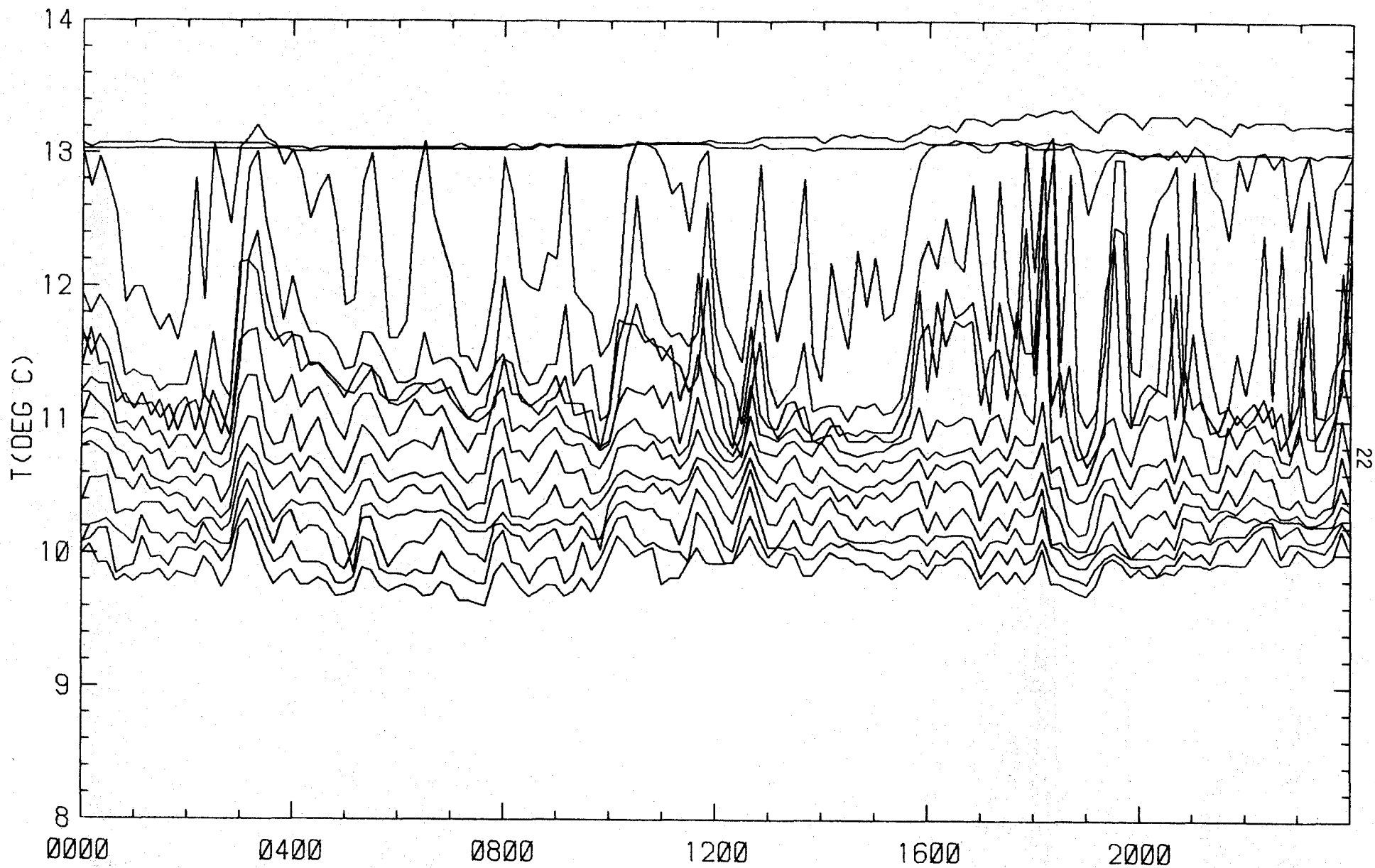
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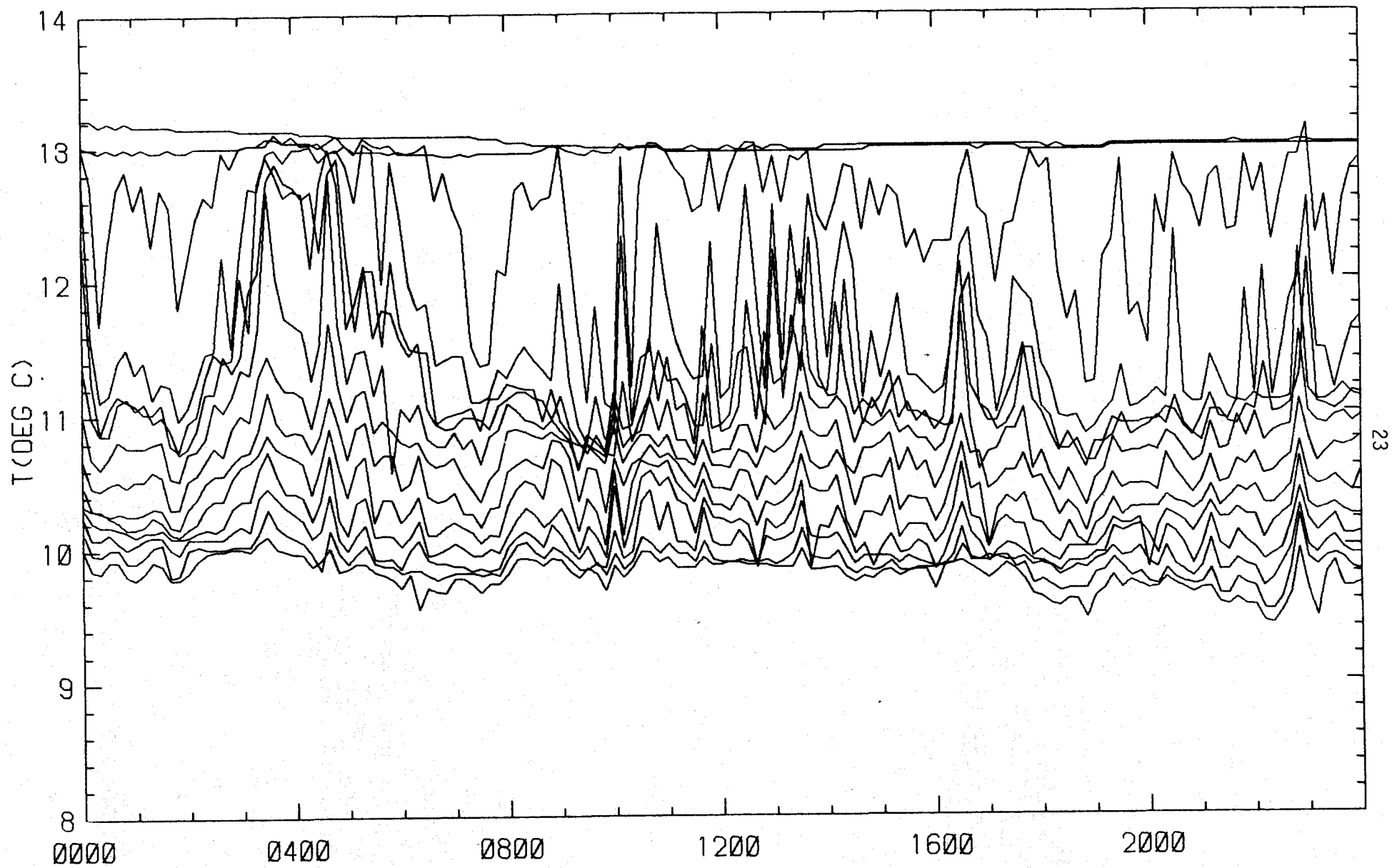
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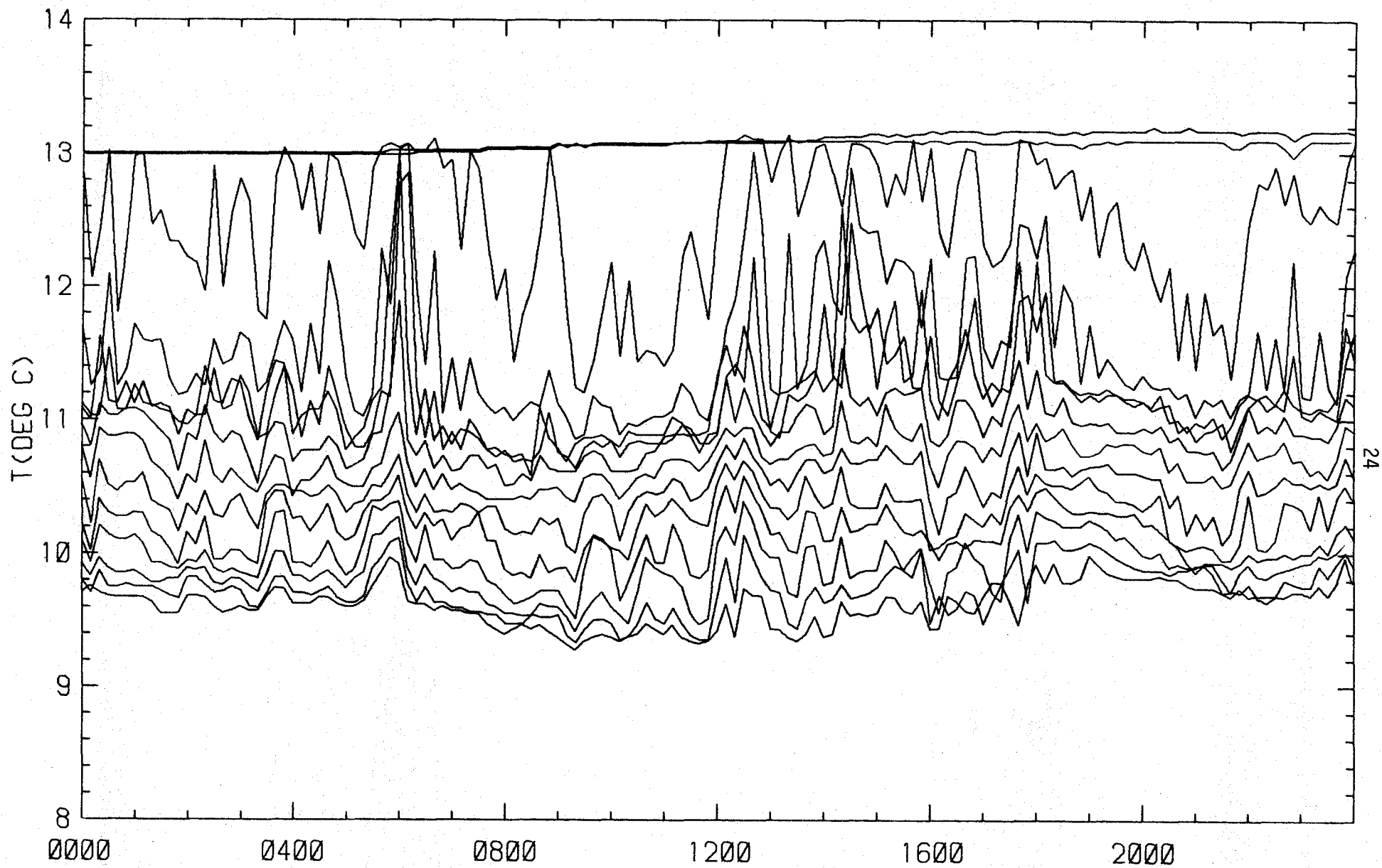
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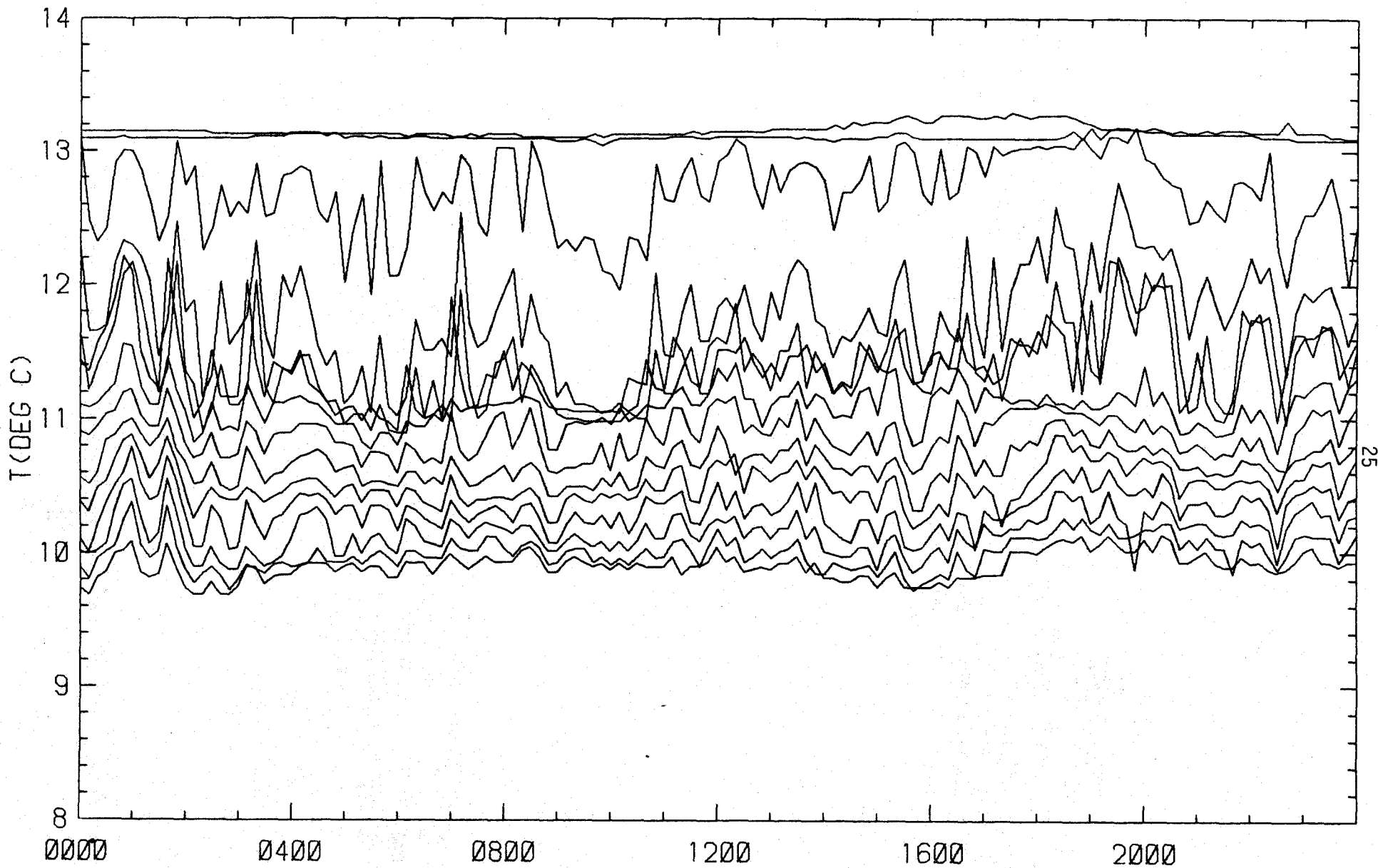


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24

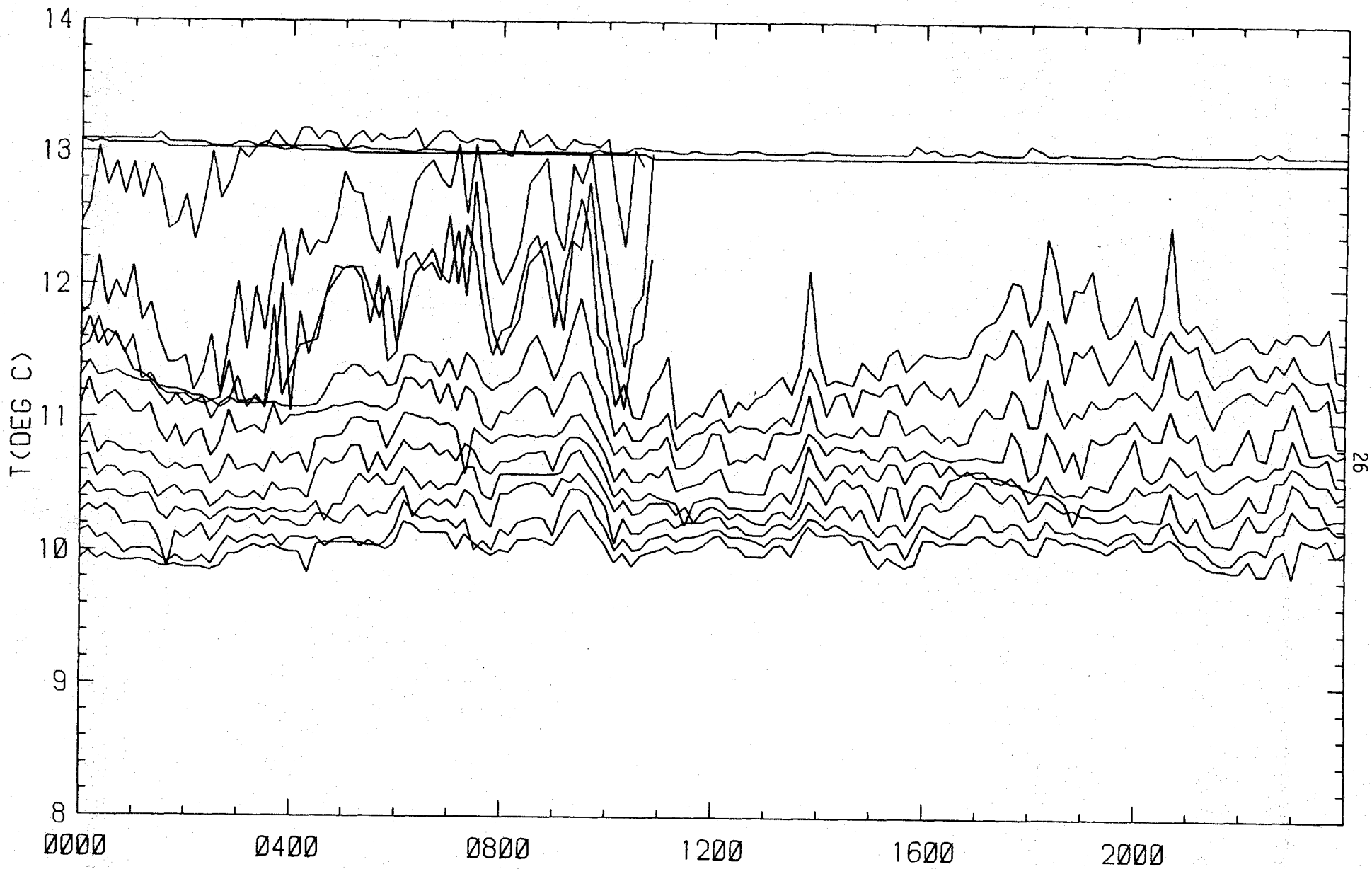
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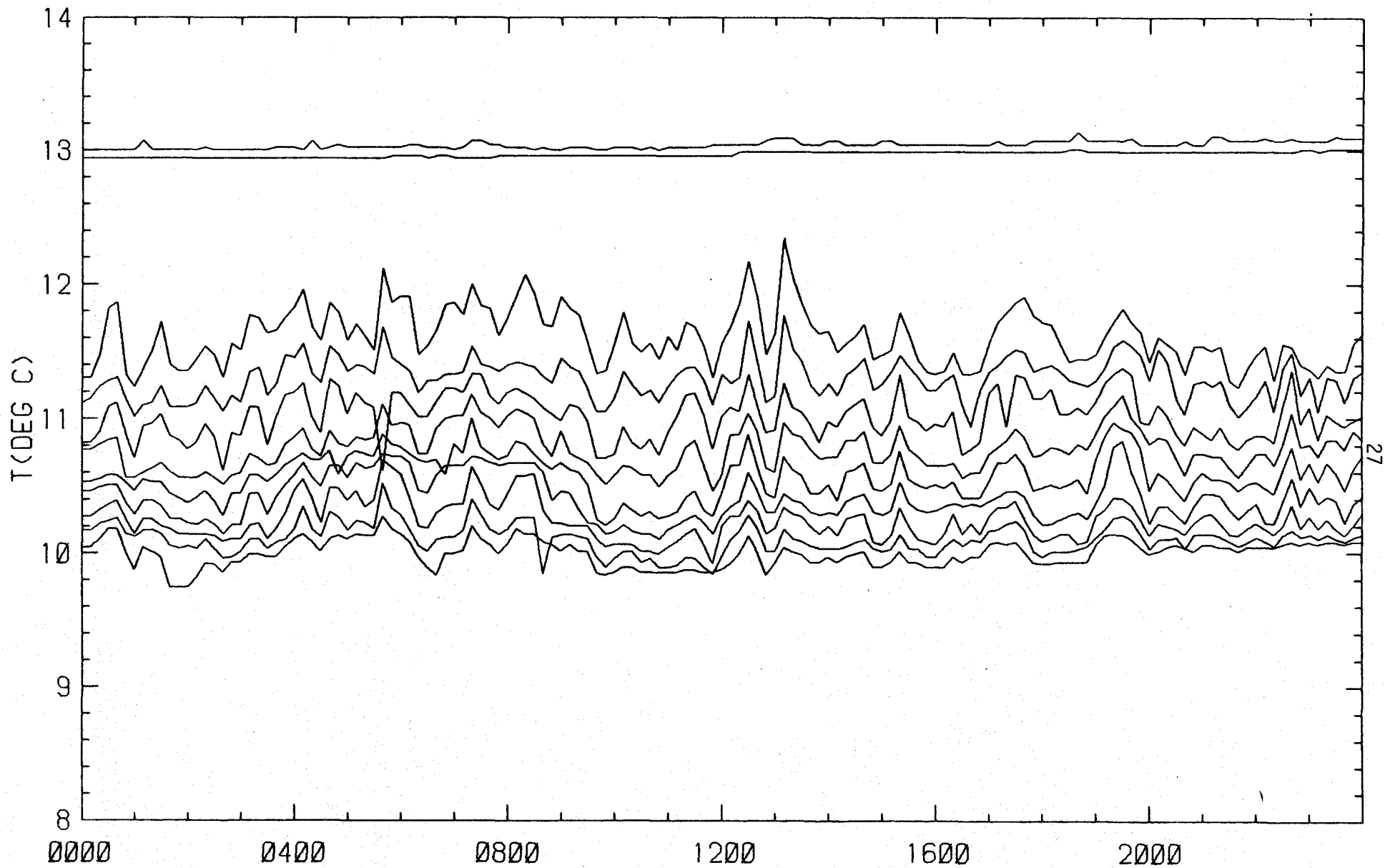
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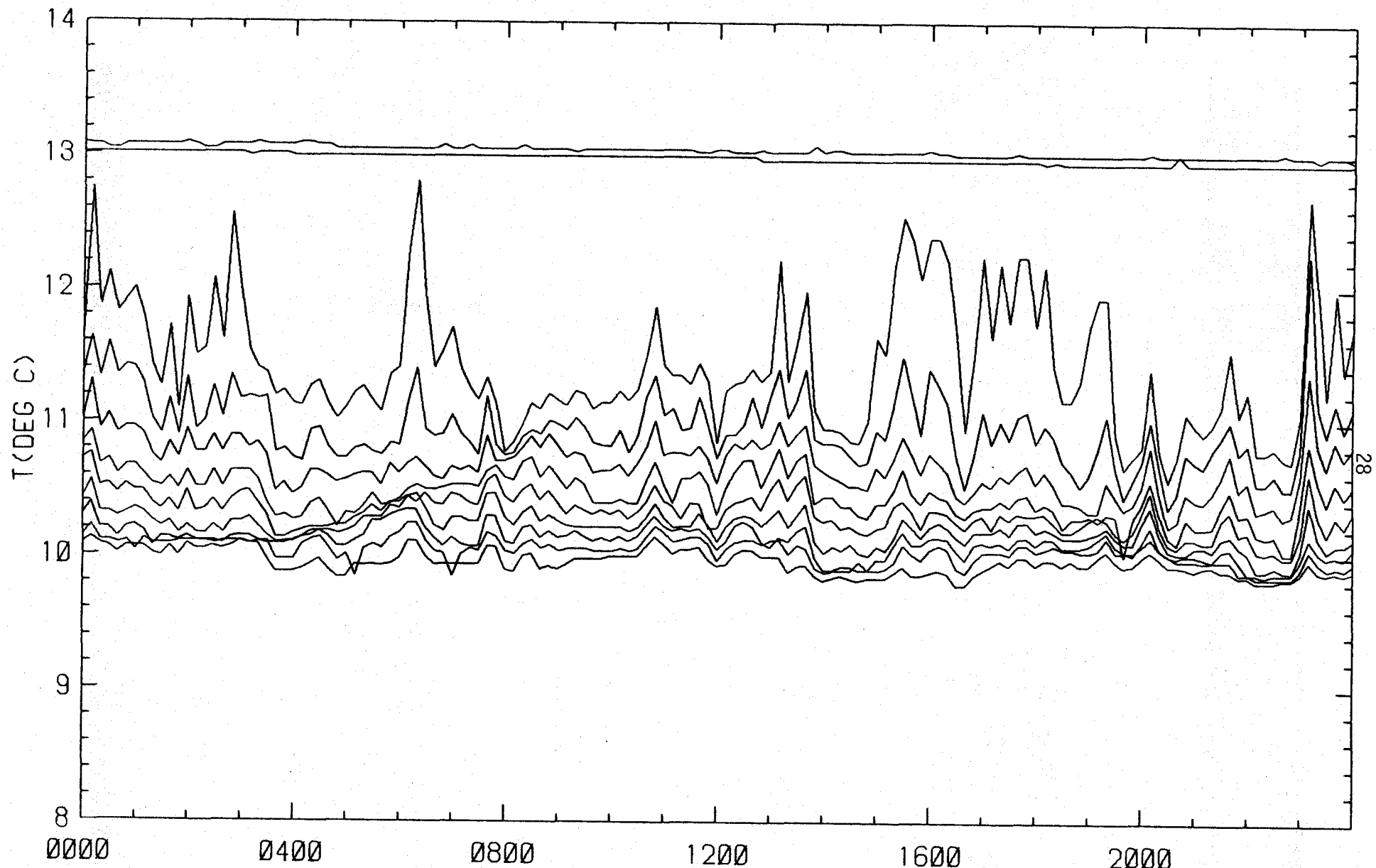




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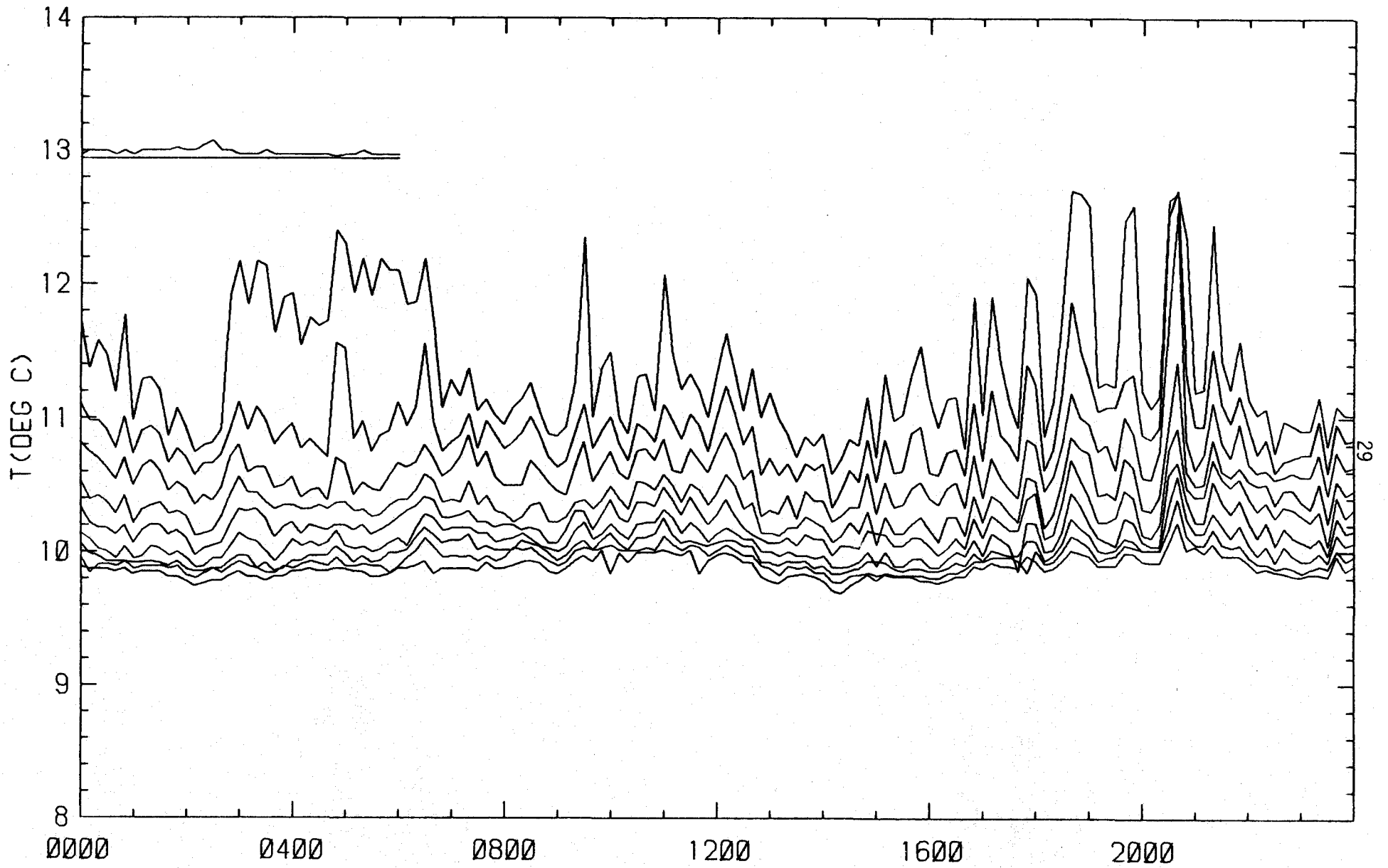


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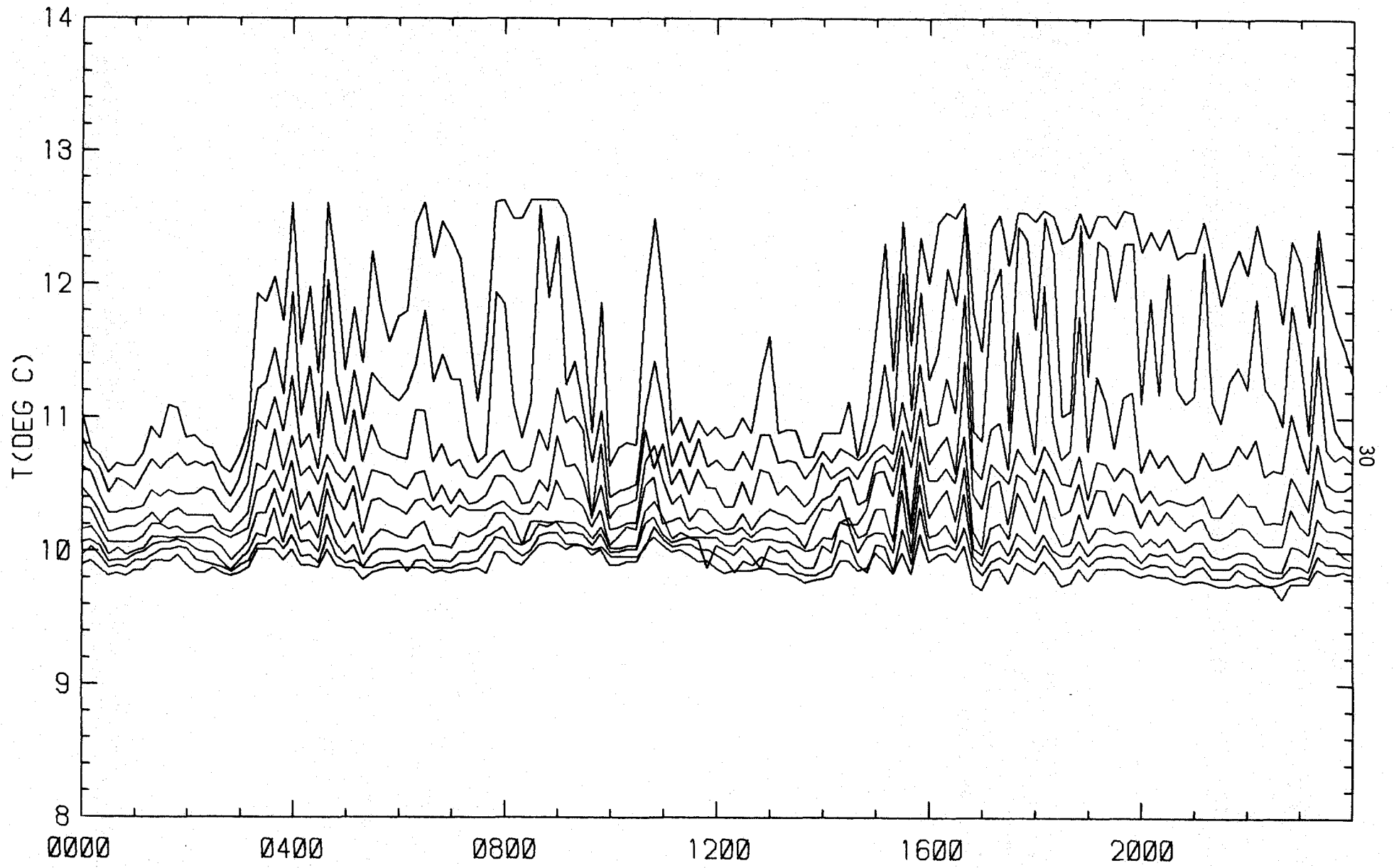


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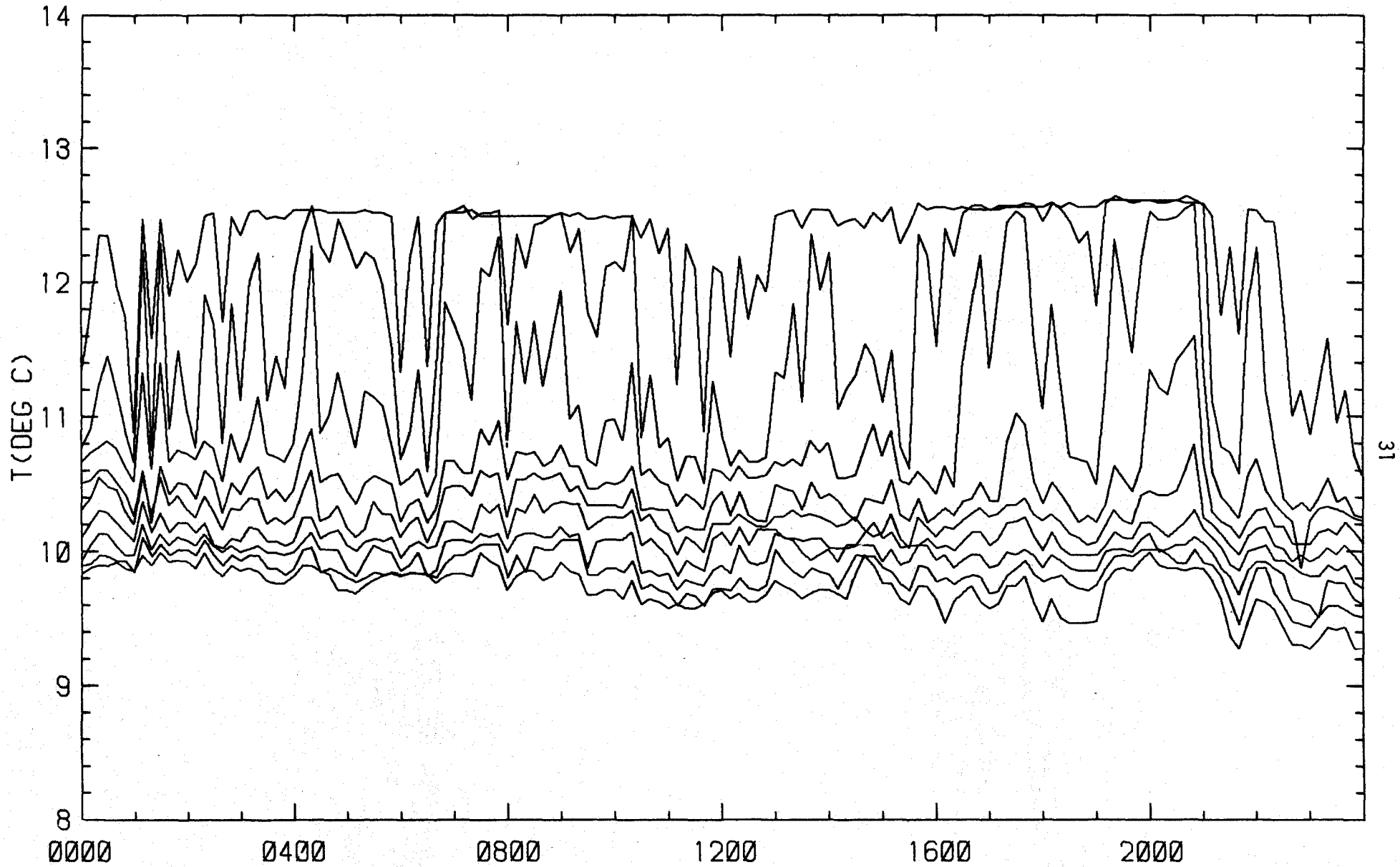


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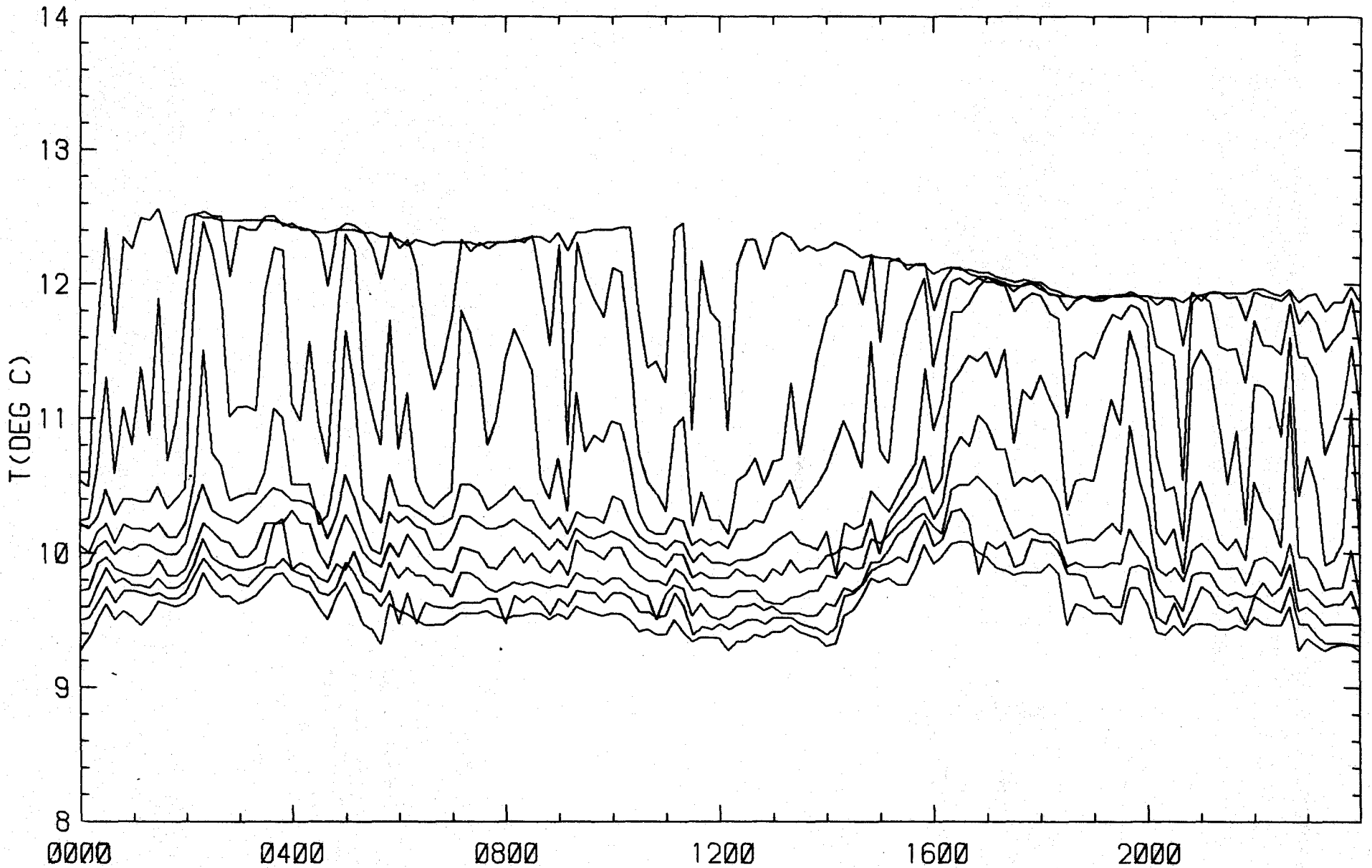


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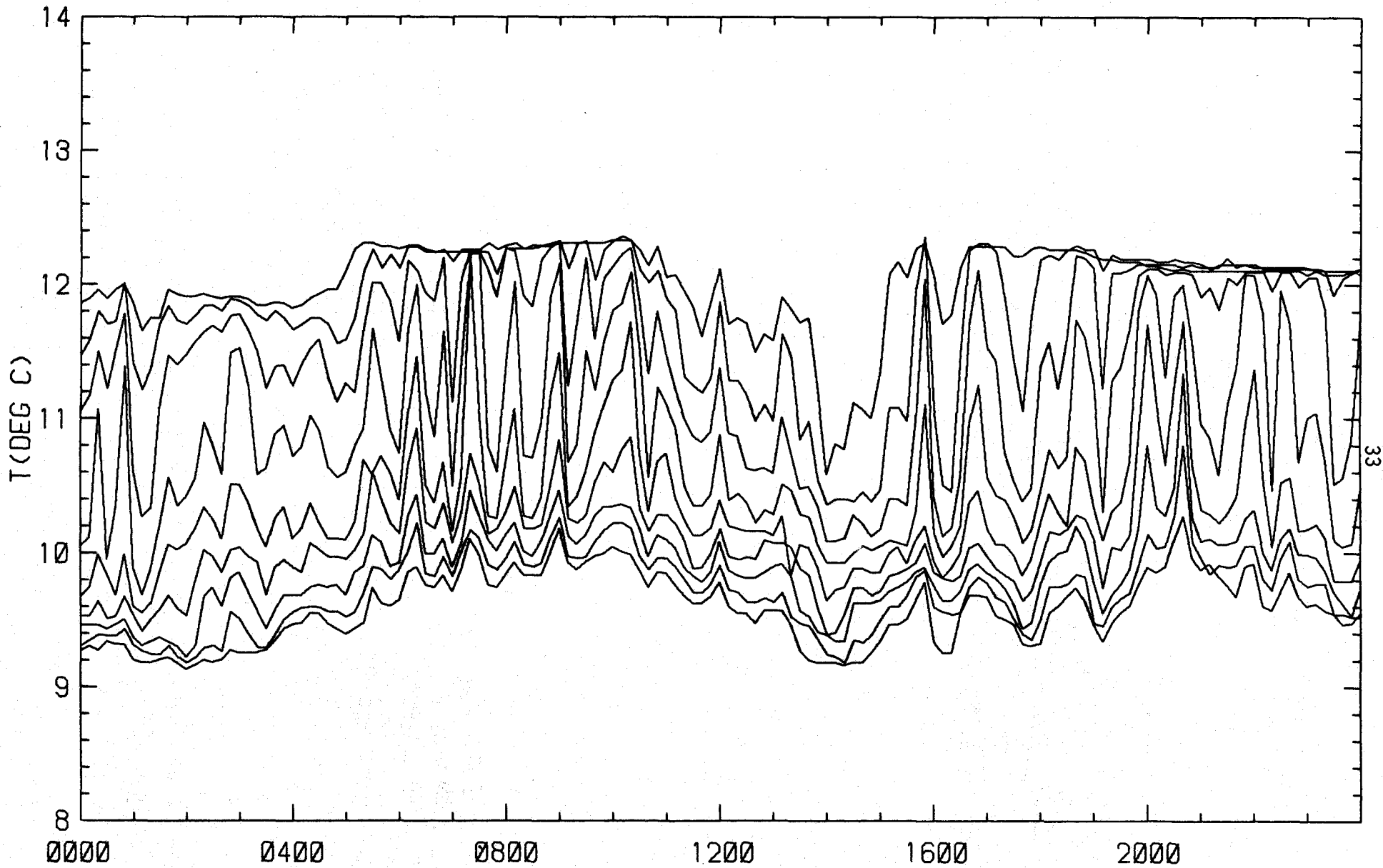
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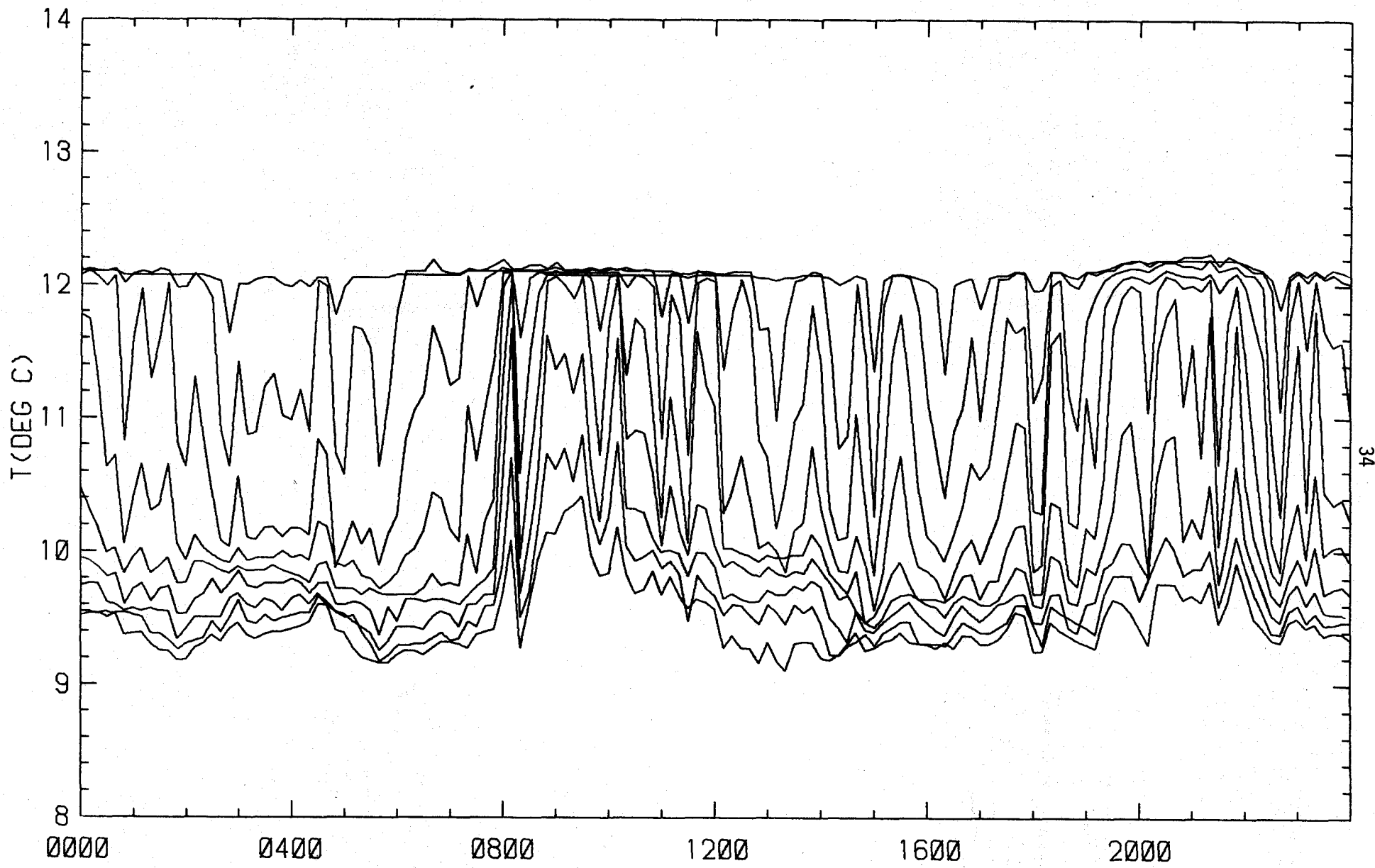


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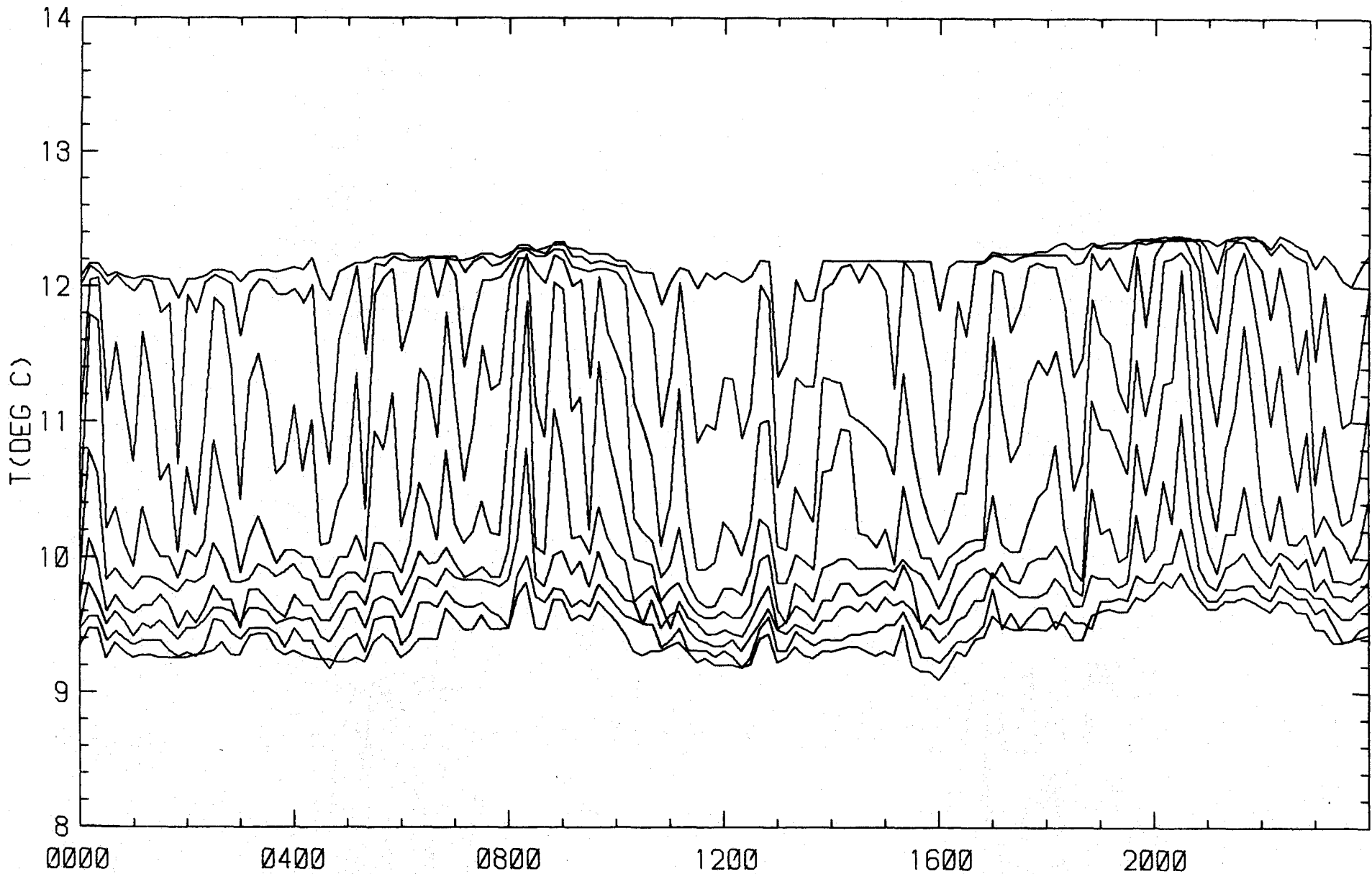


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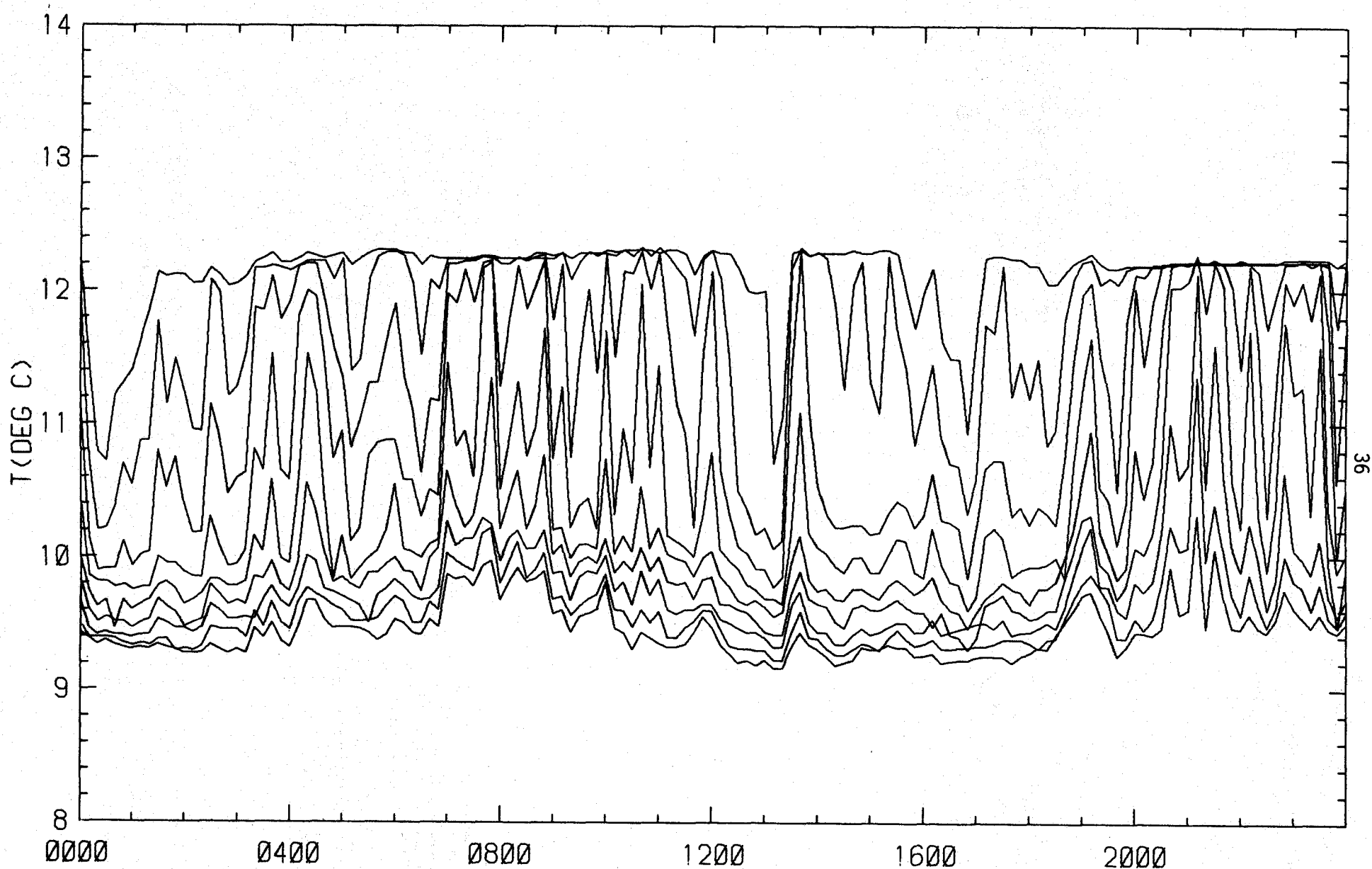




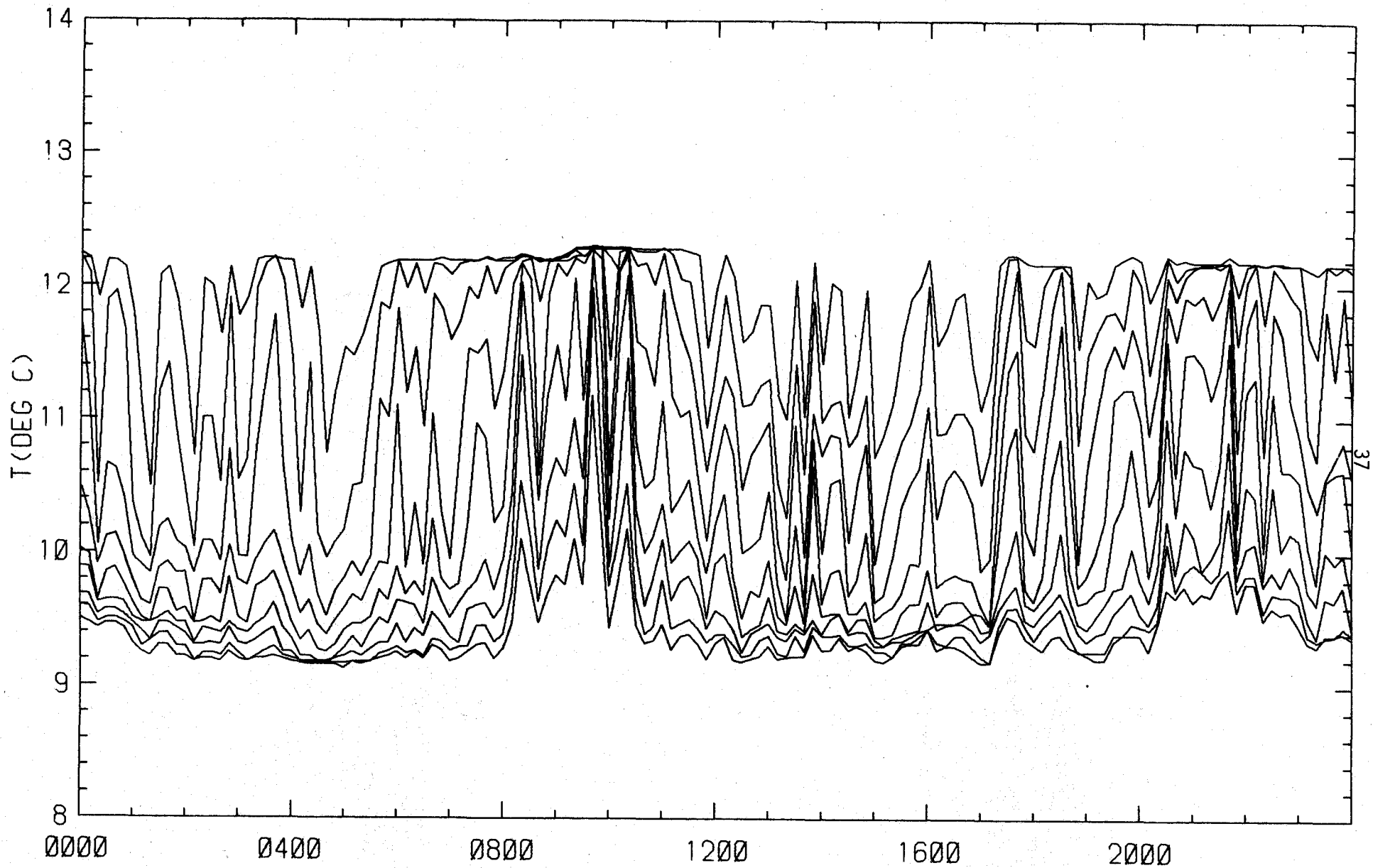
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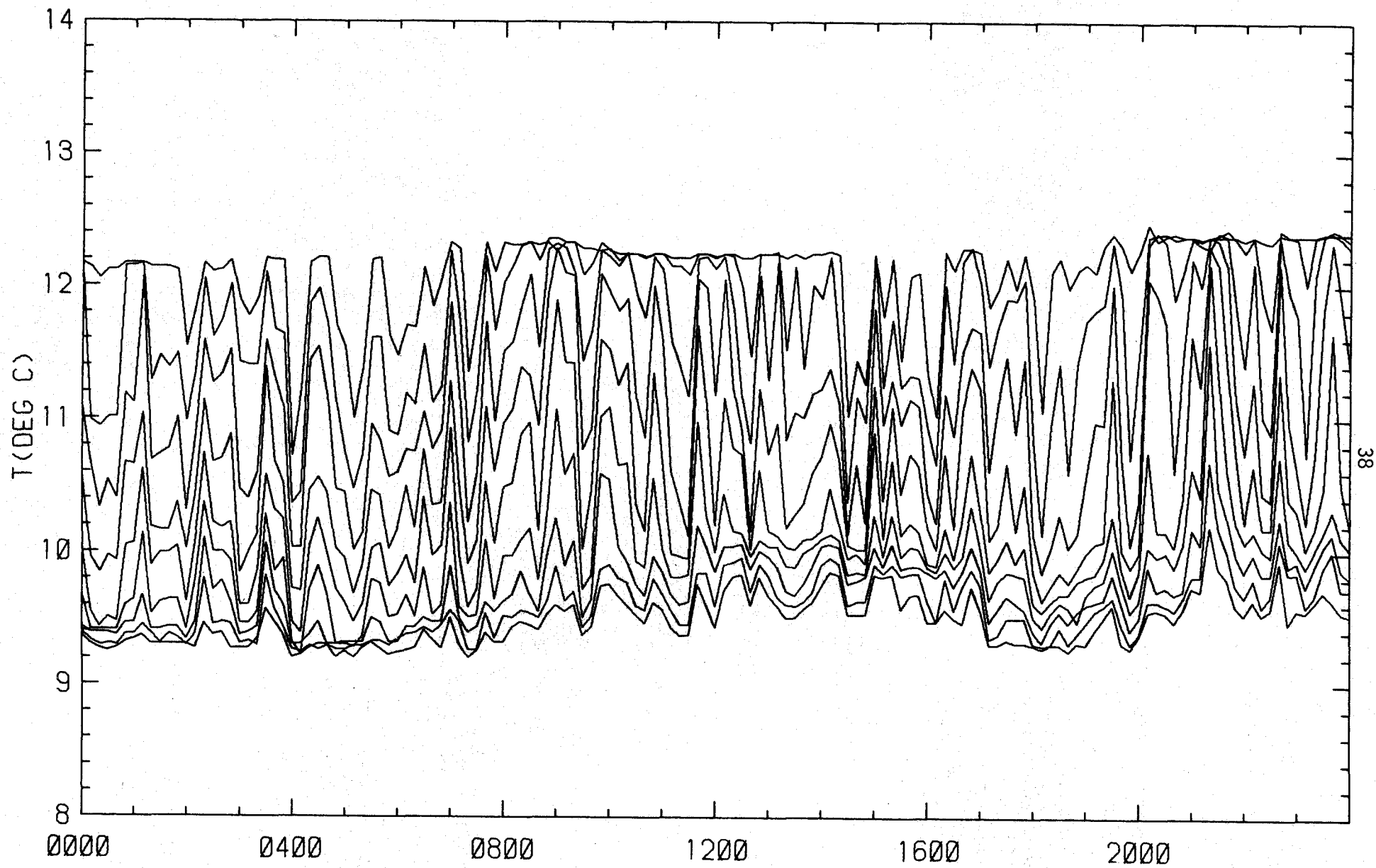
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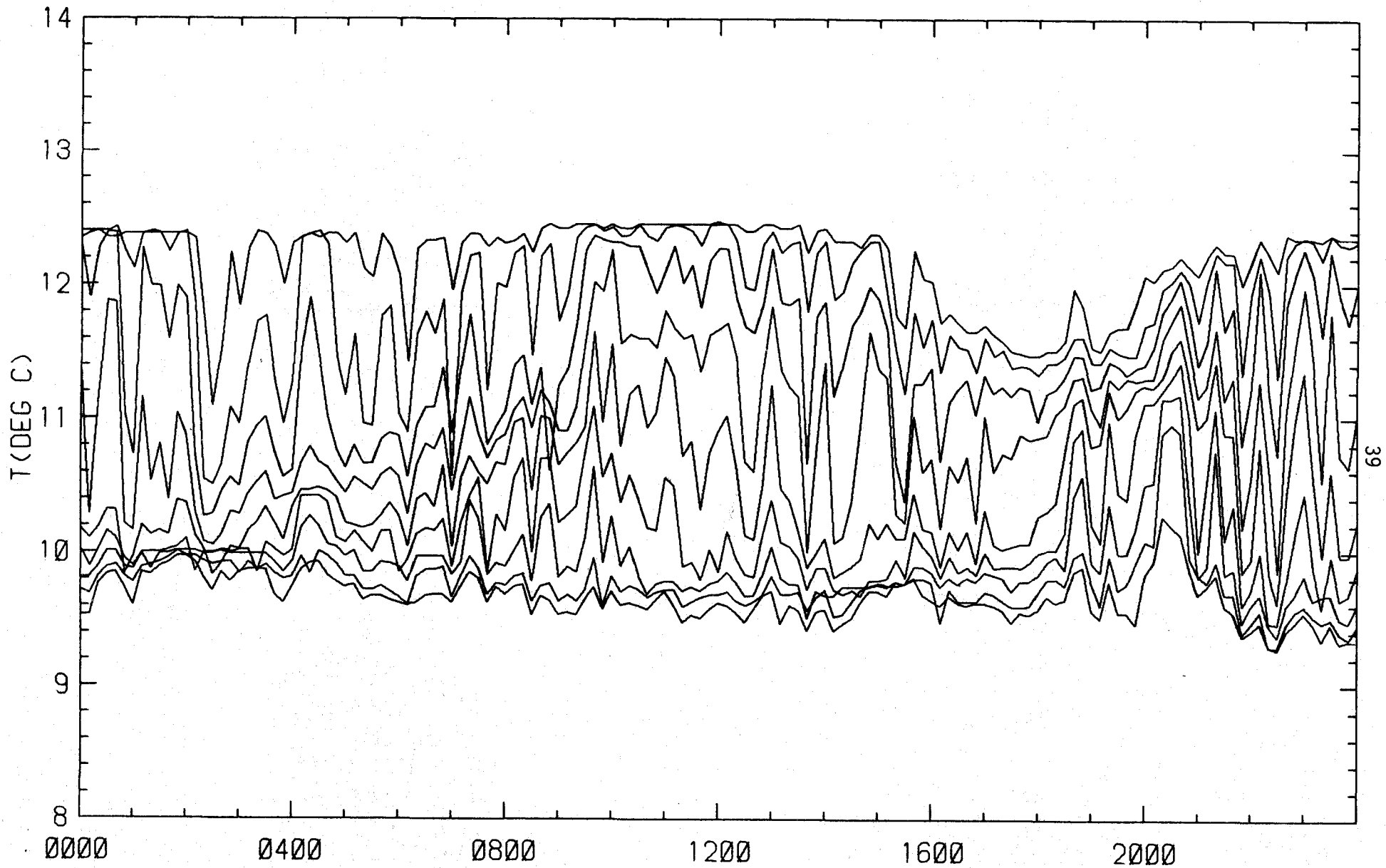
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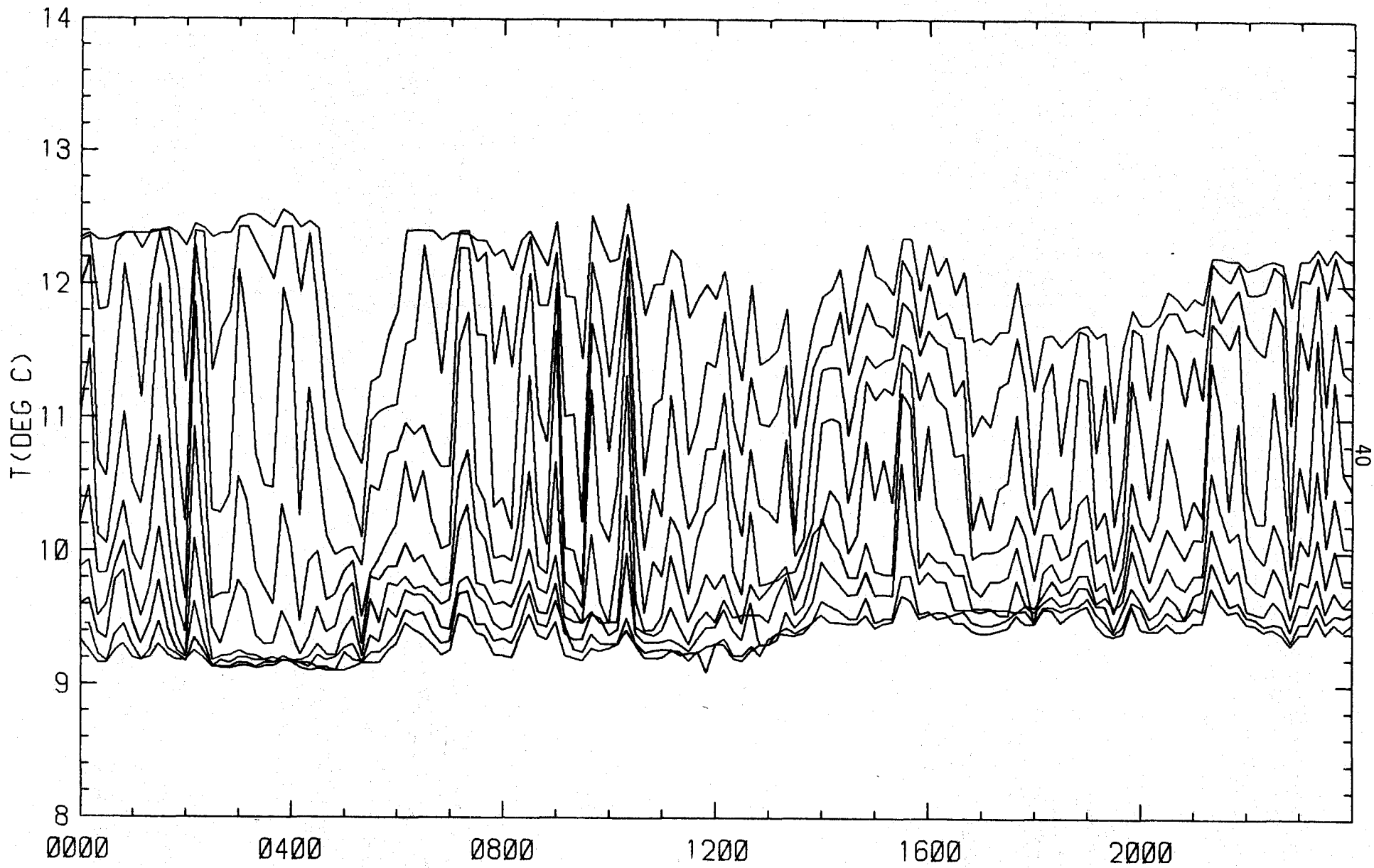
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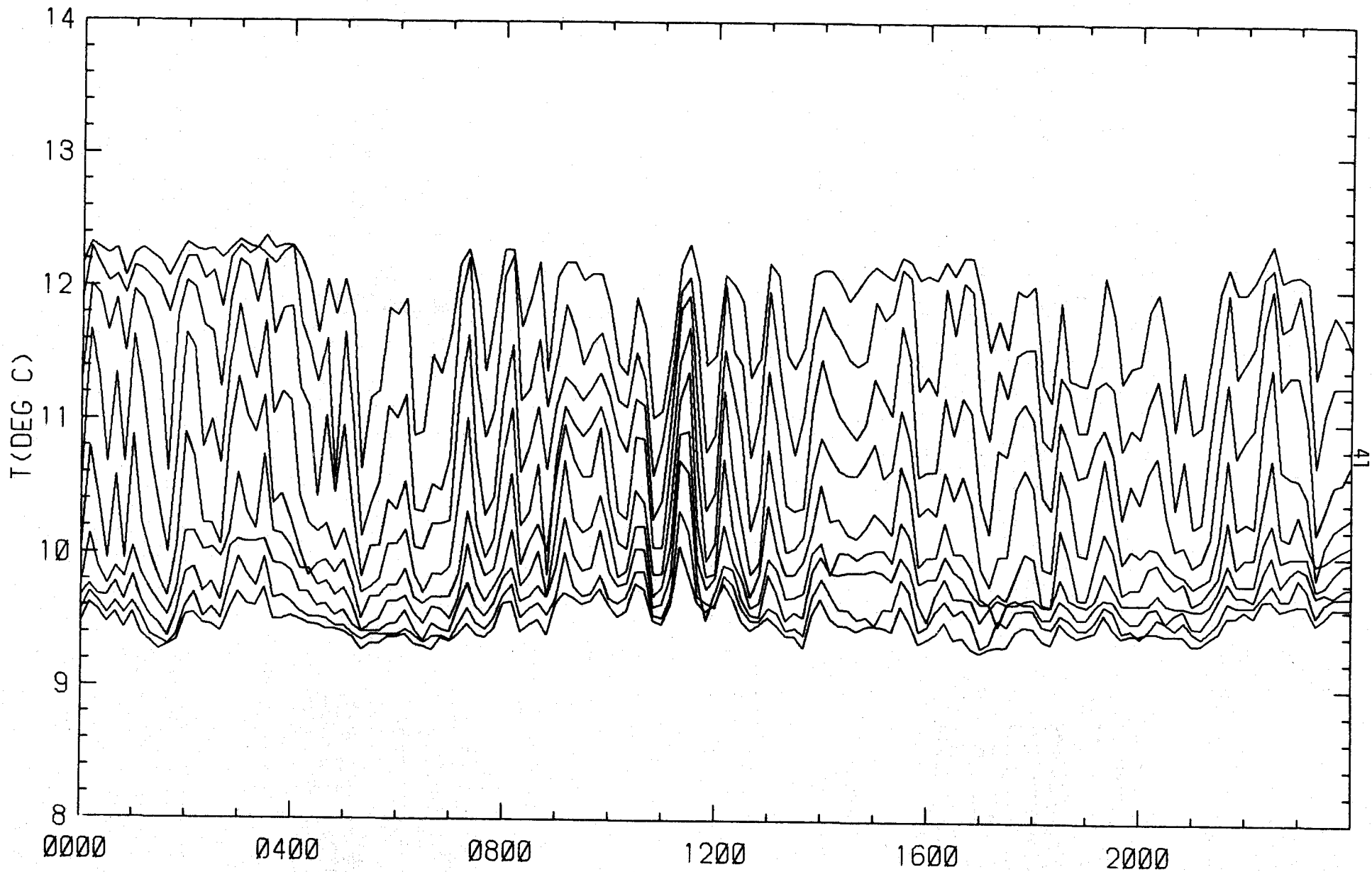
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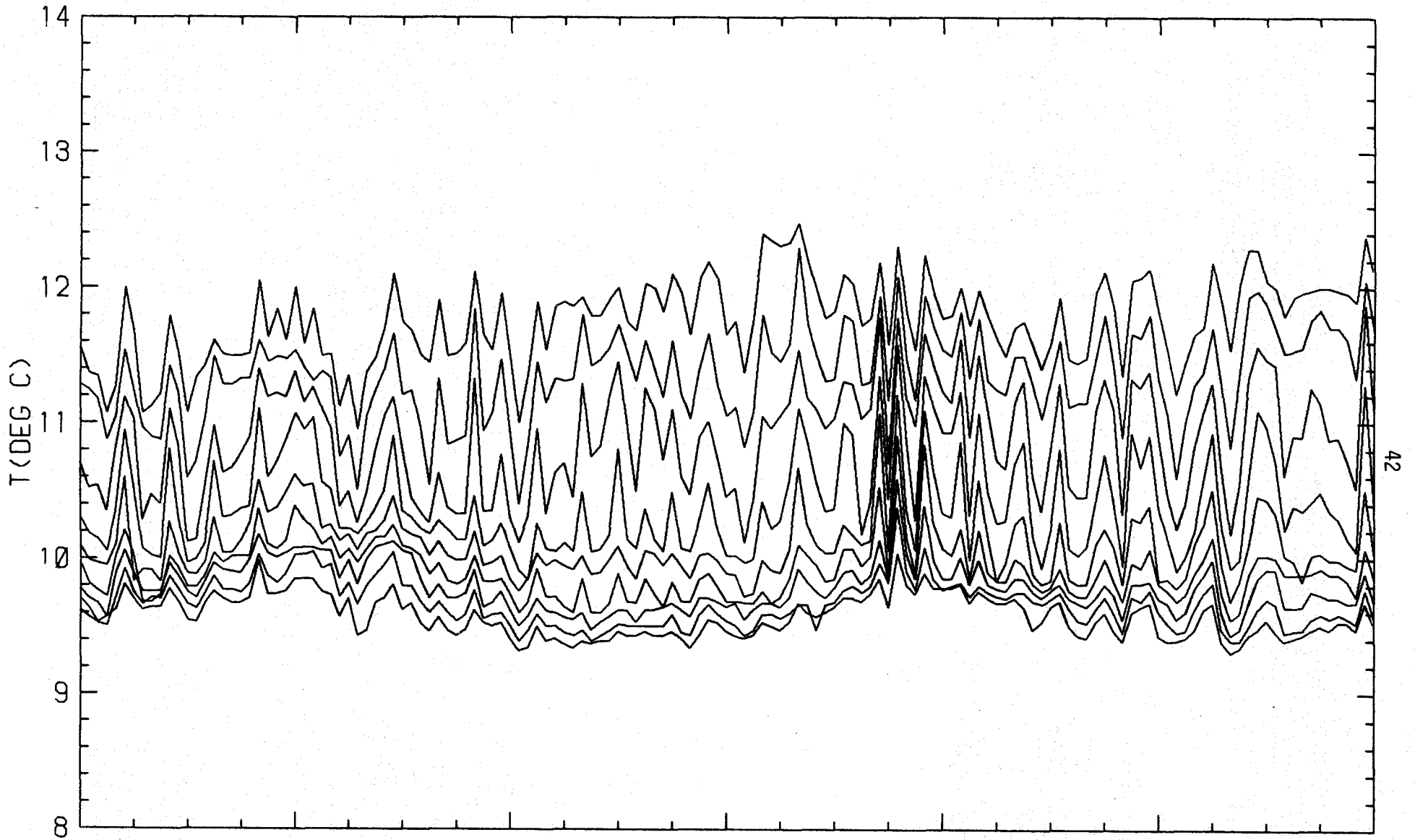
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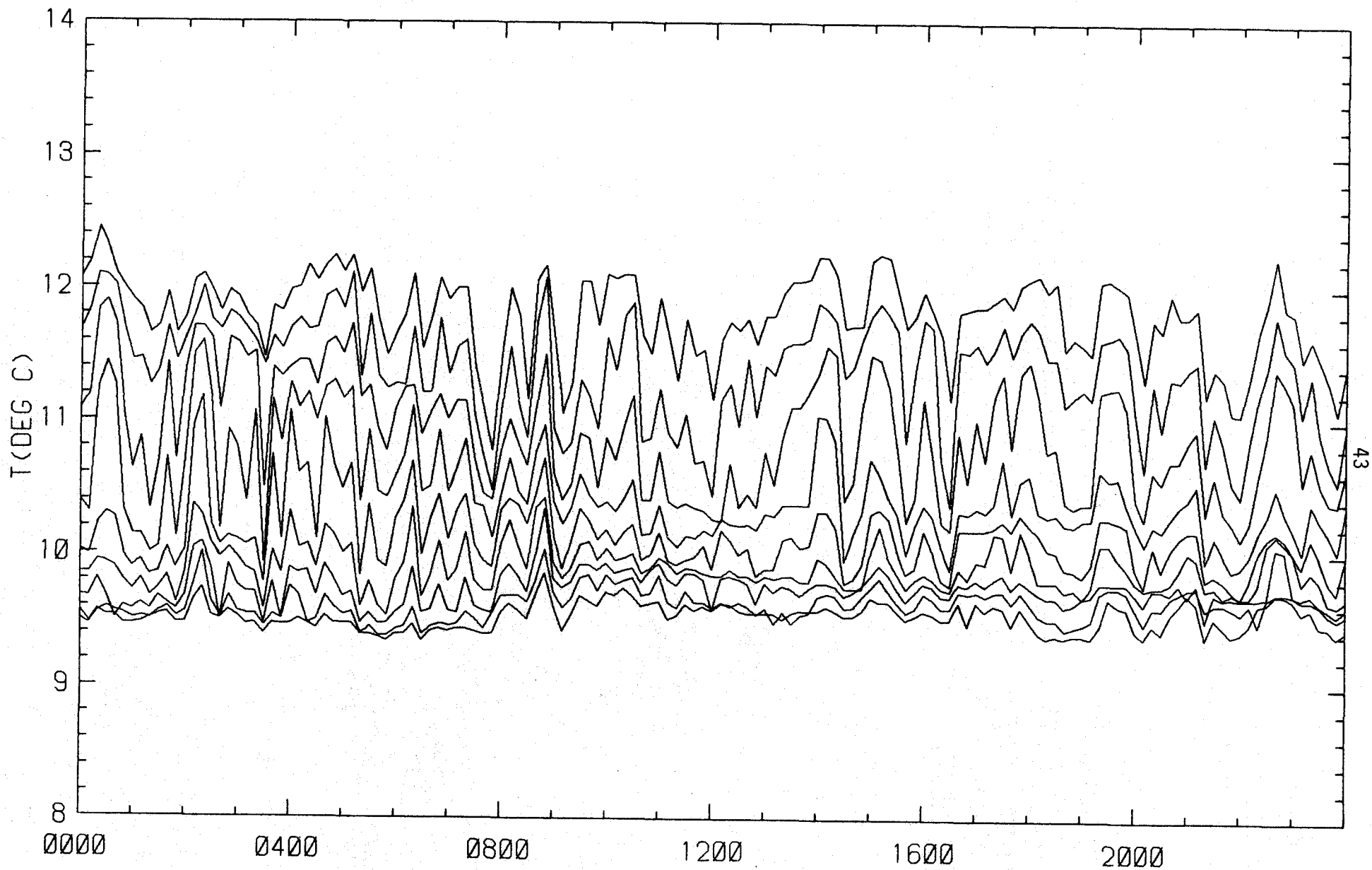




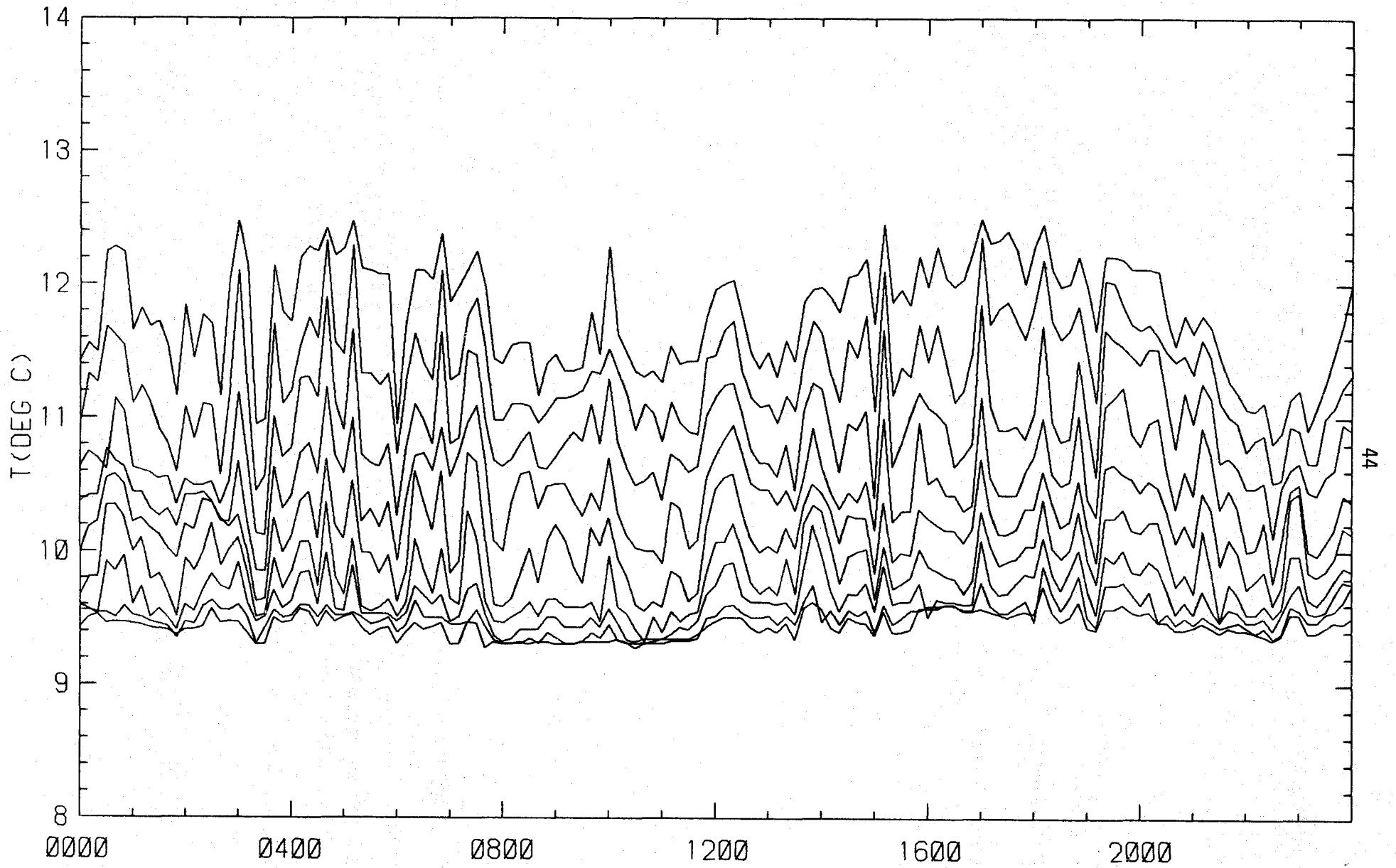
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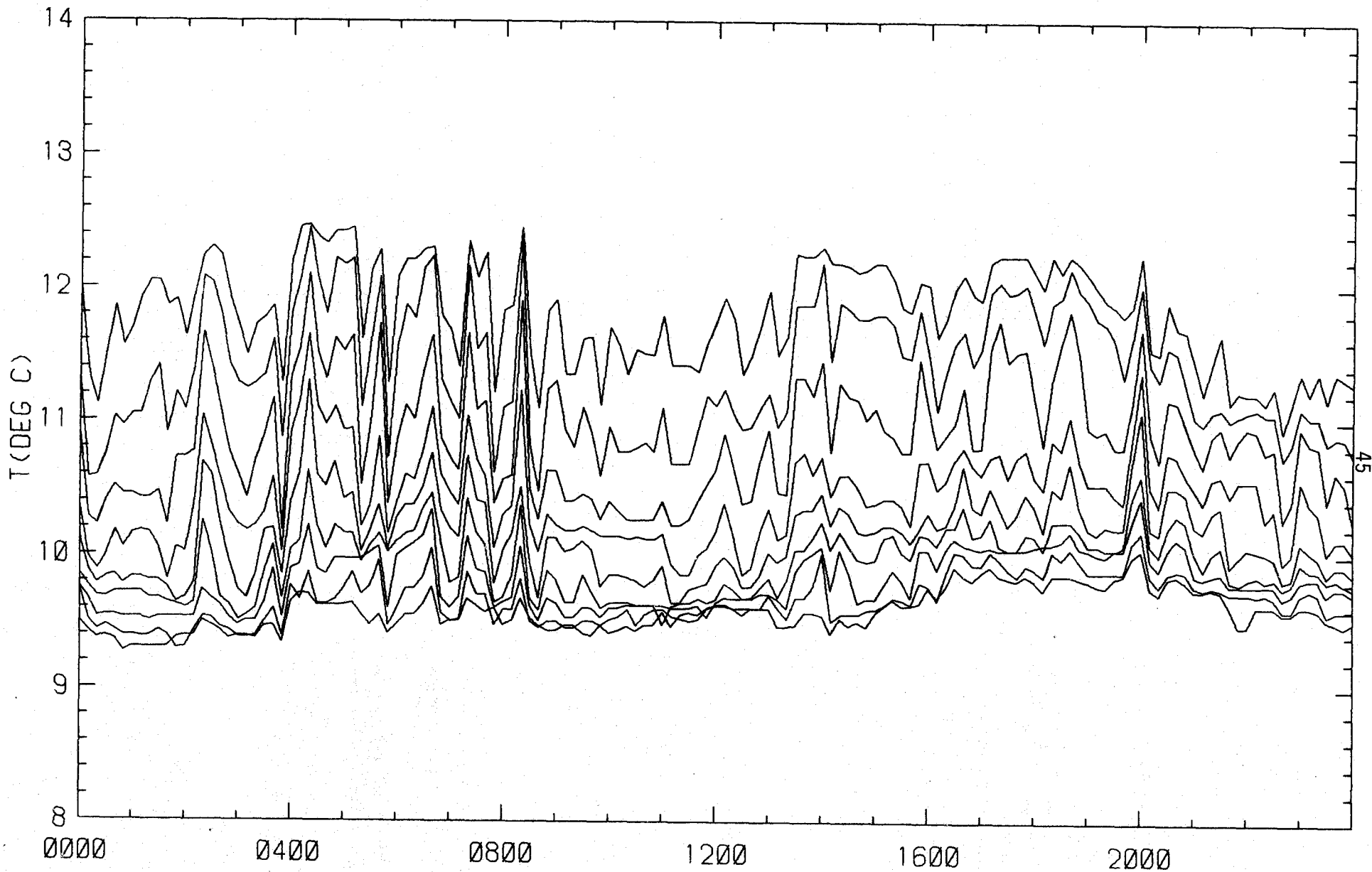
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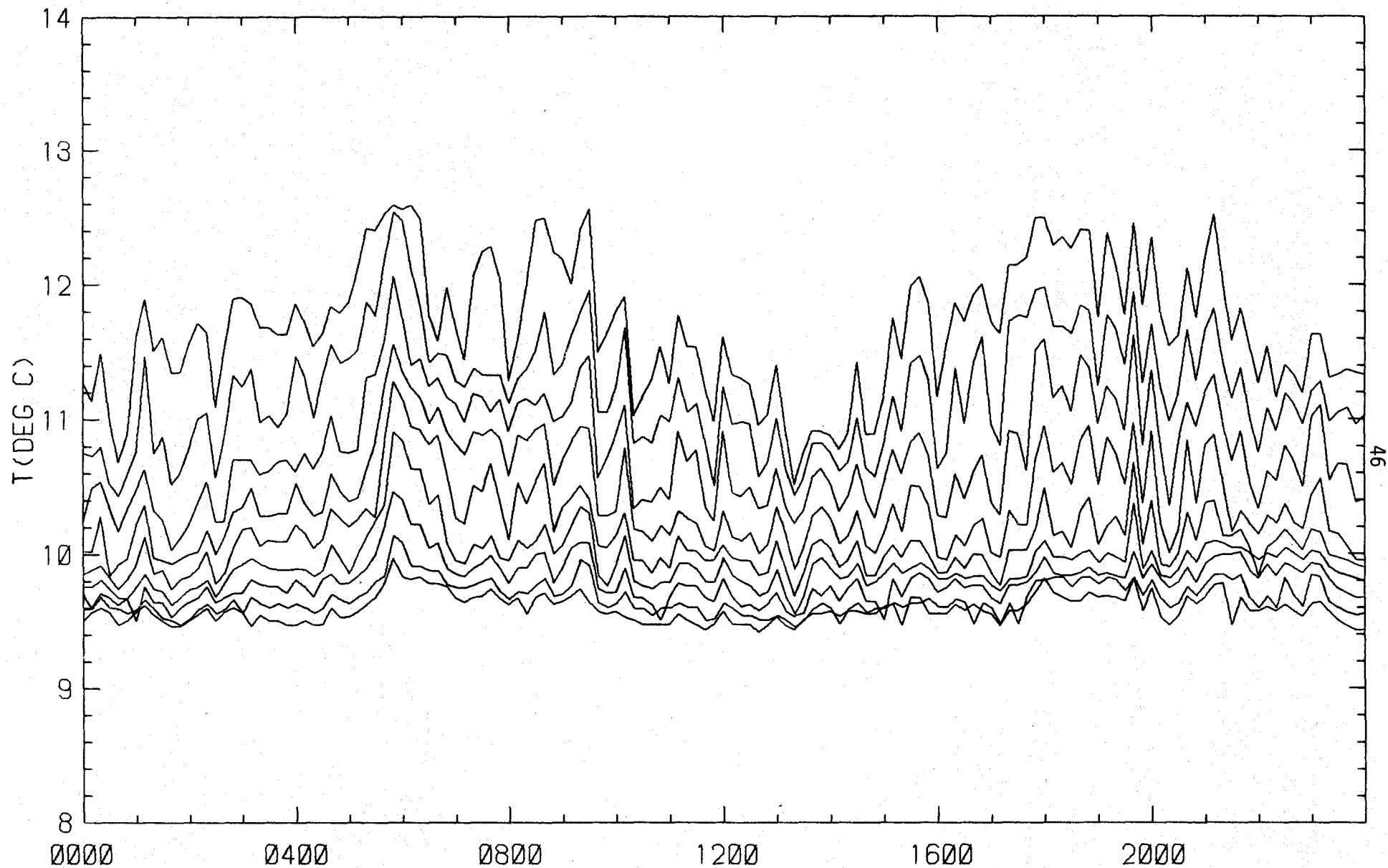


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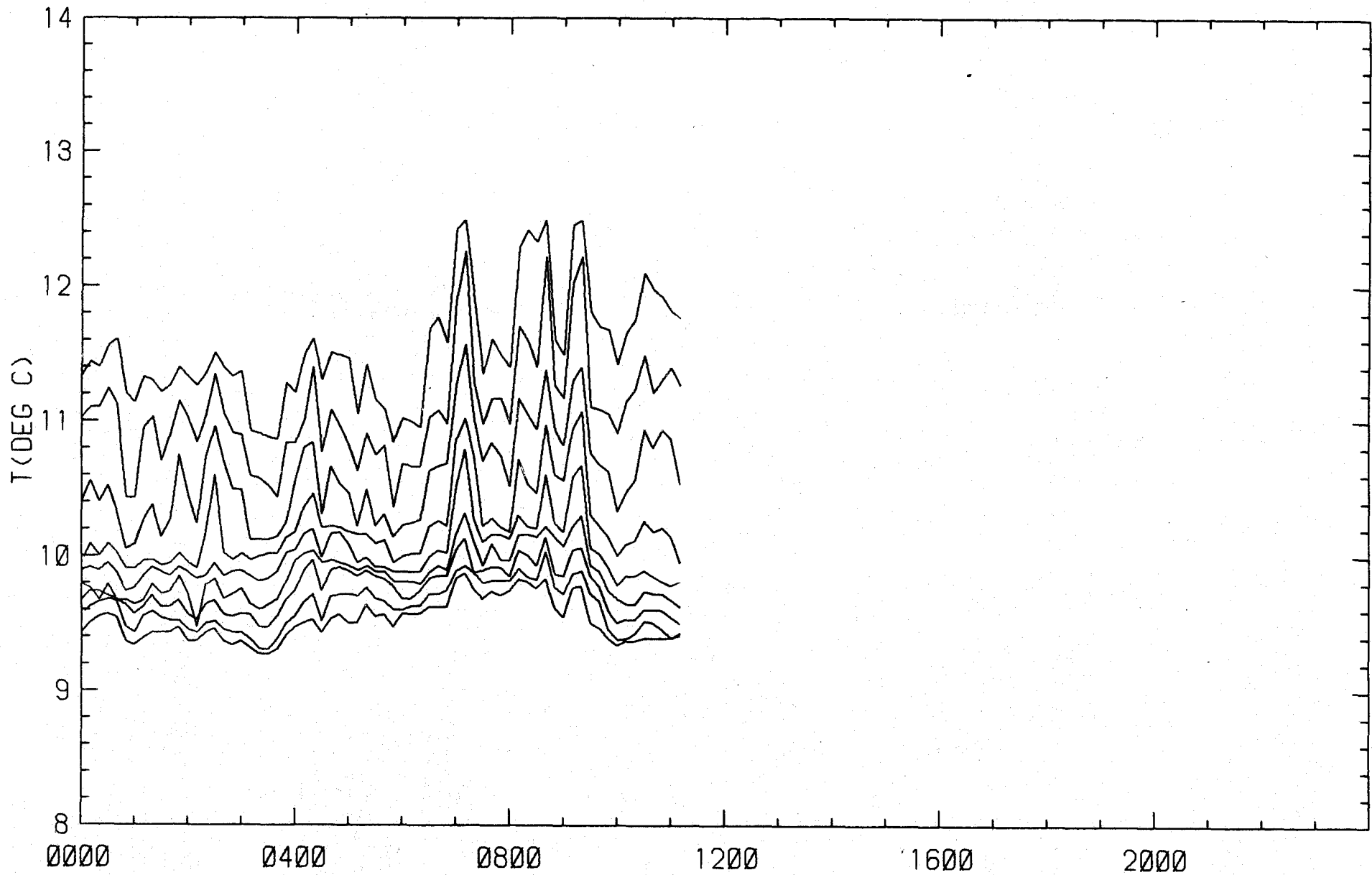
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46

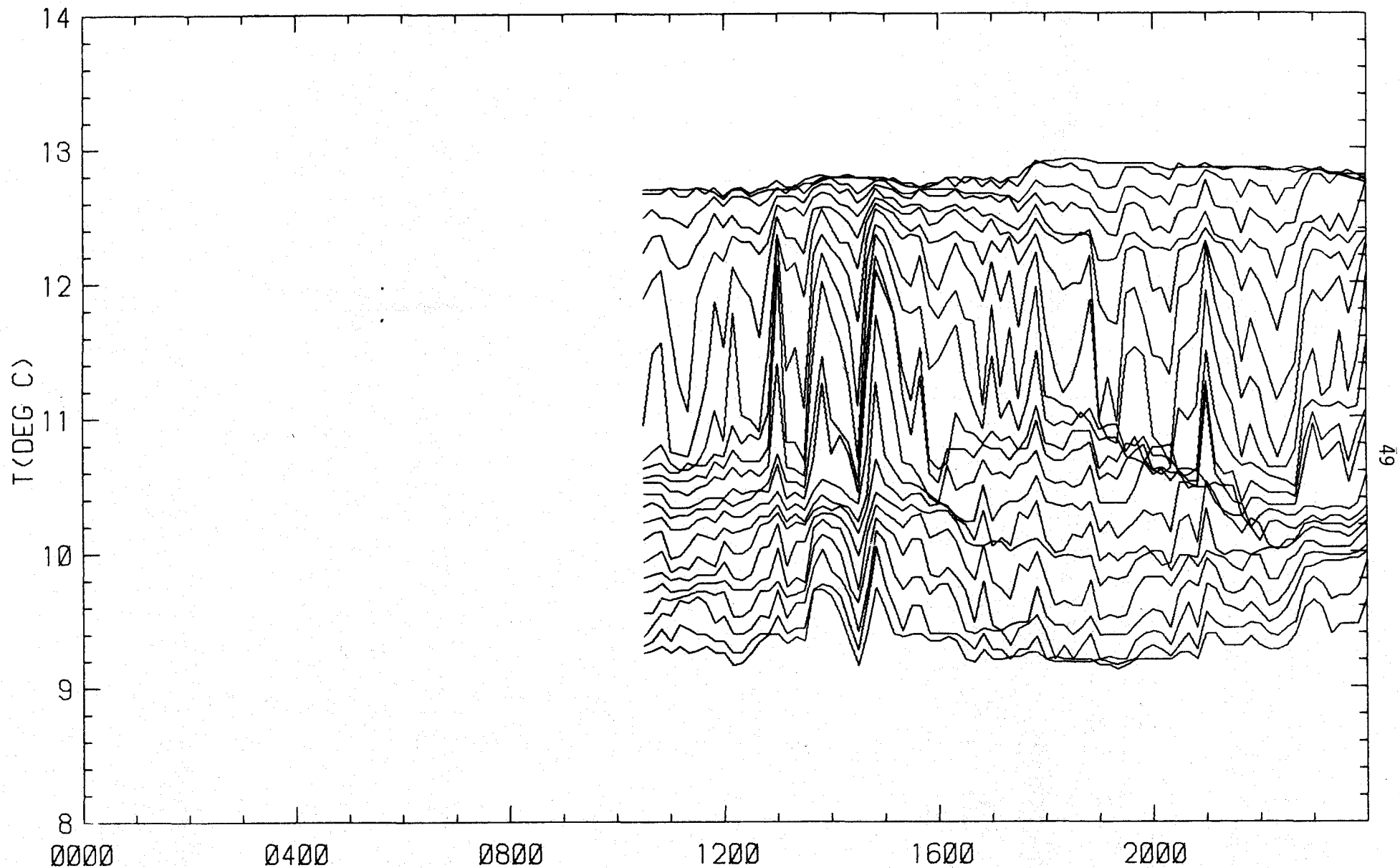
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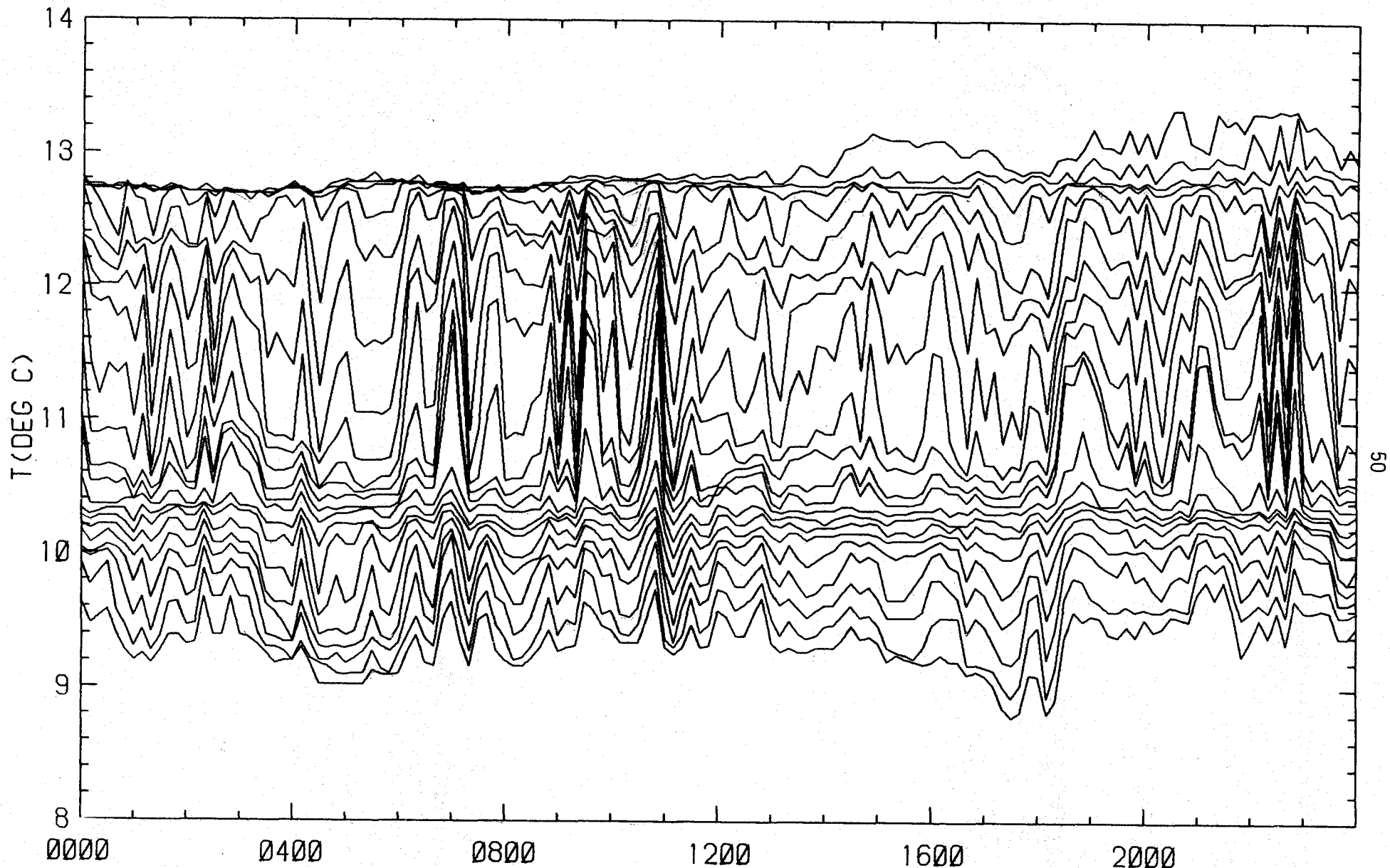
APPENDIX D

Temperature Observations at B2



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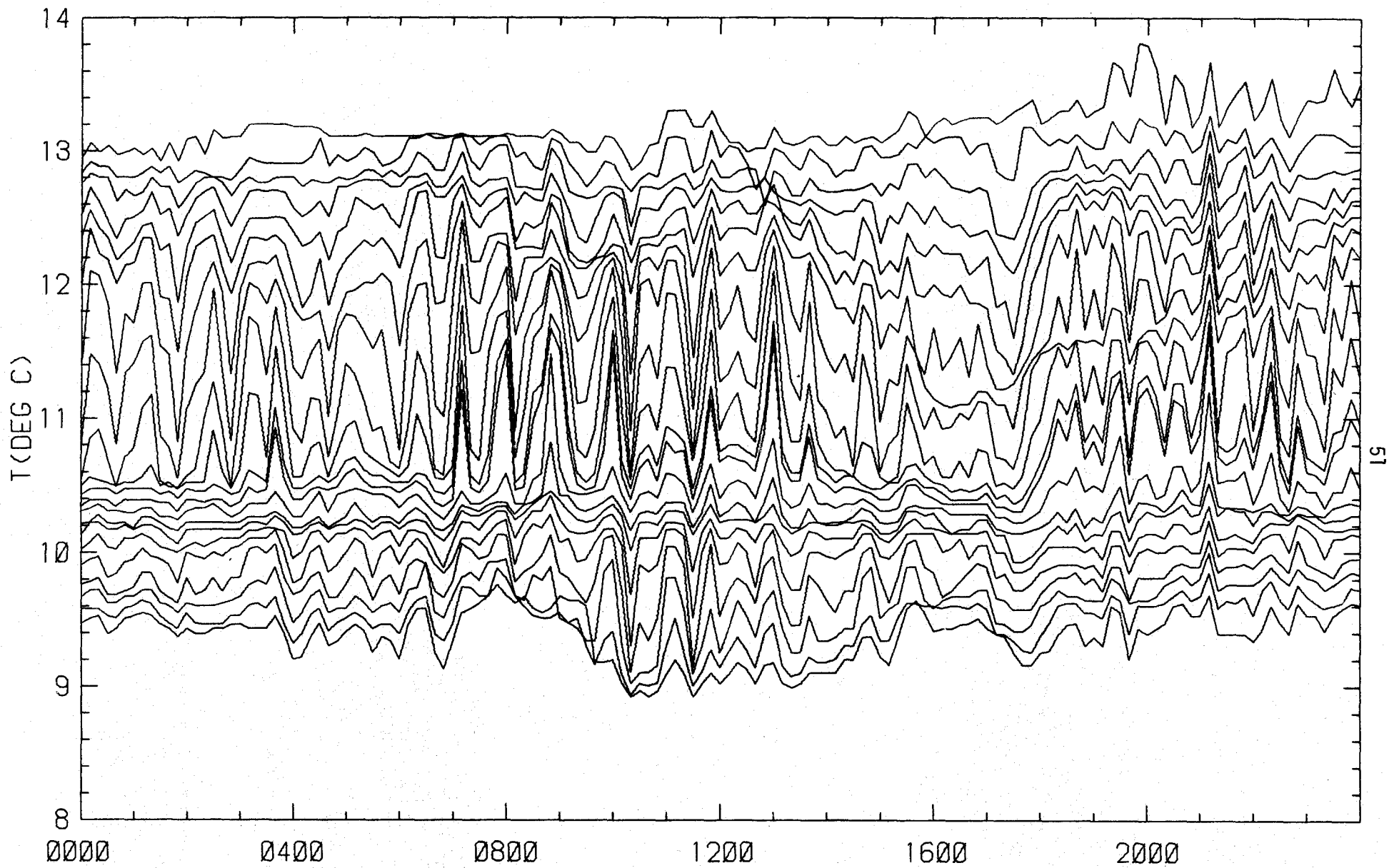




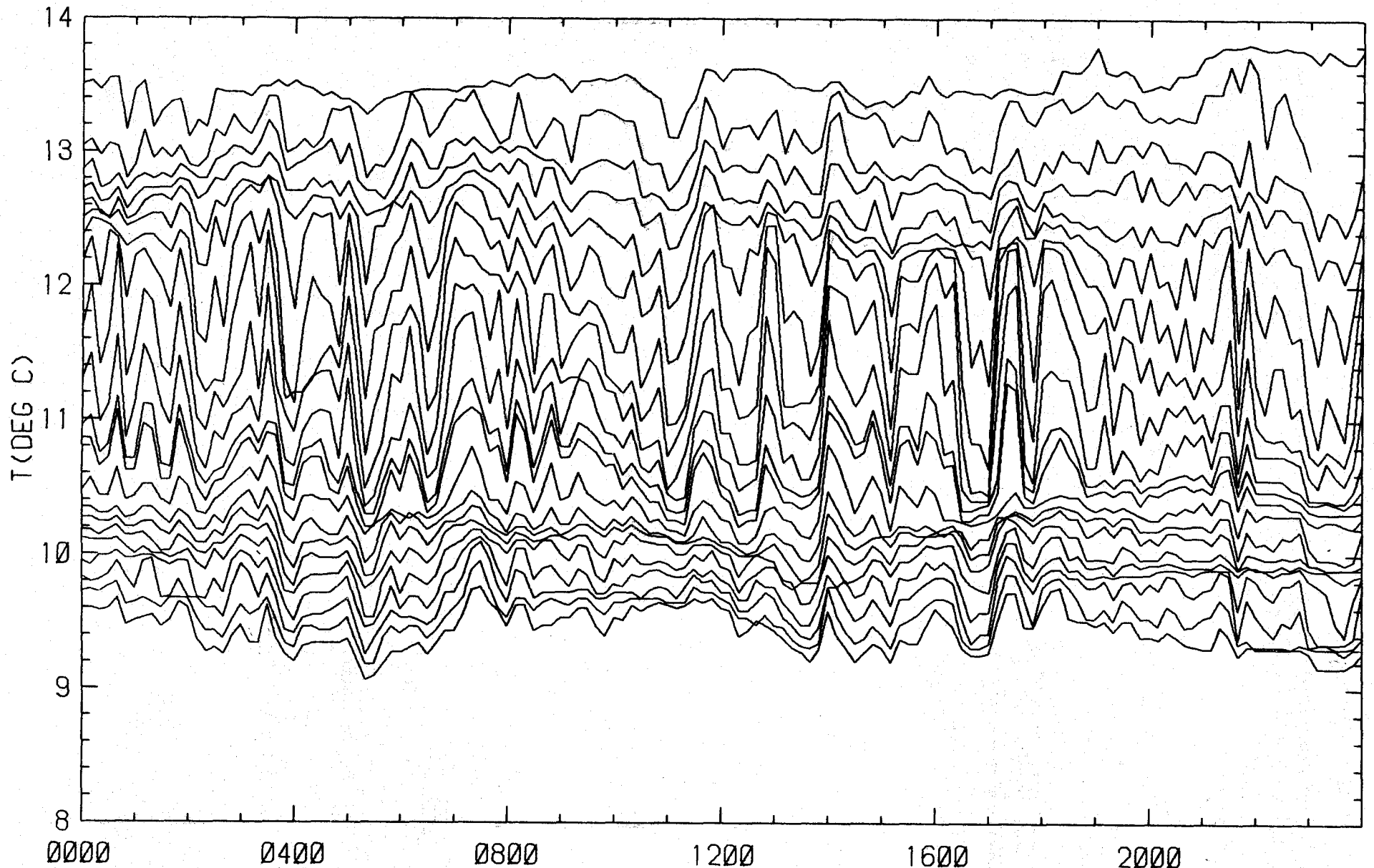
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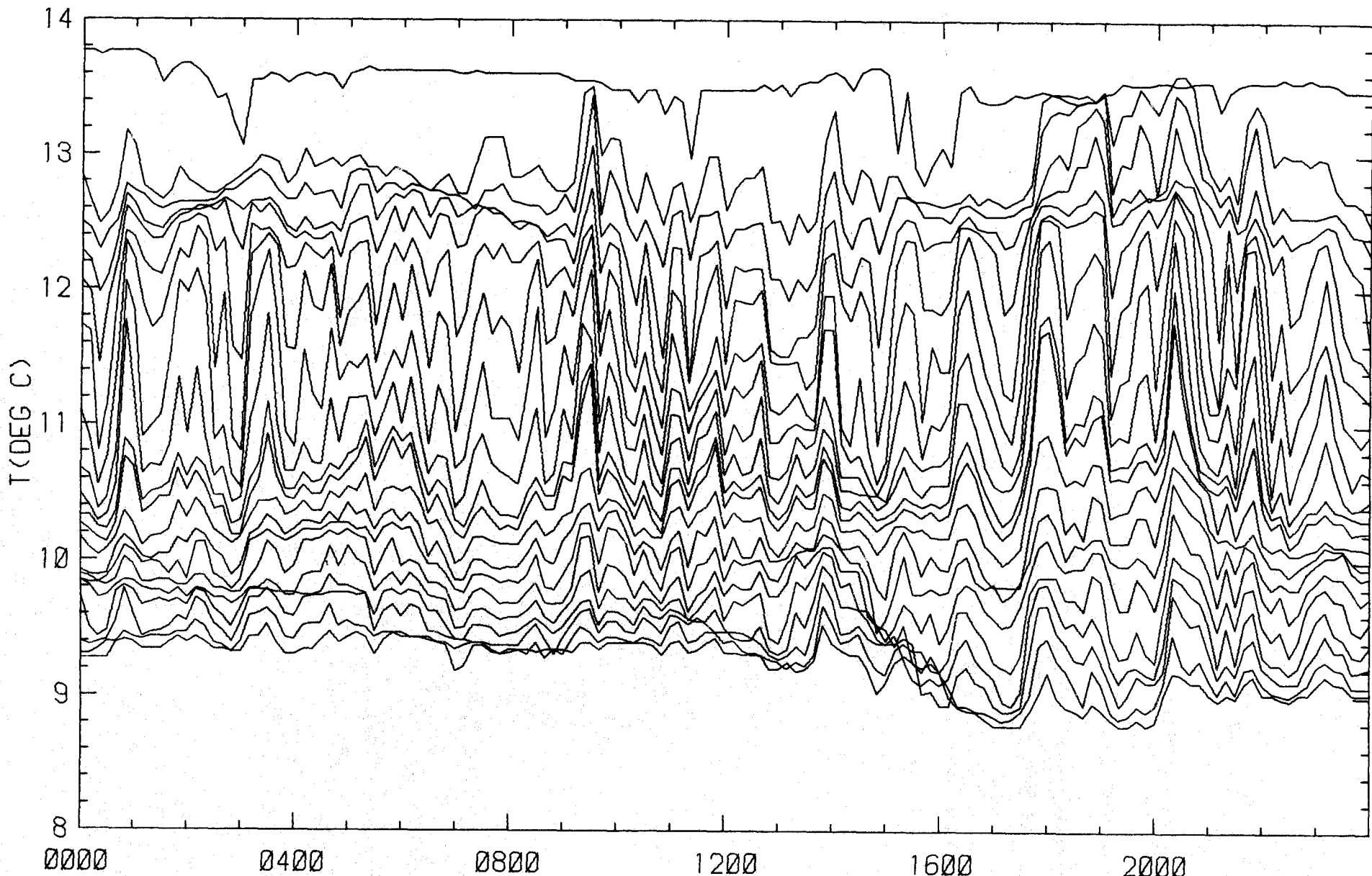
MOORING B2 TEMP VS TIME 30 JUL 78



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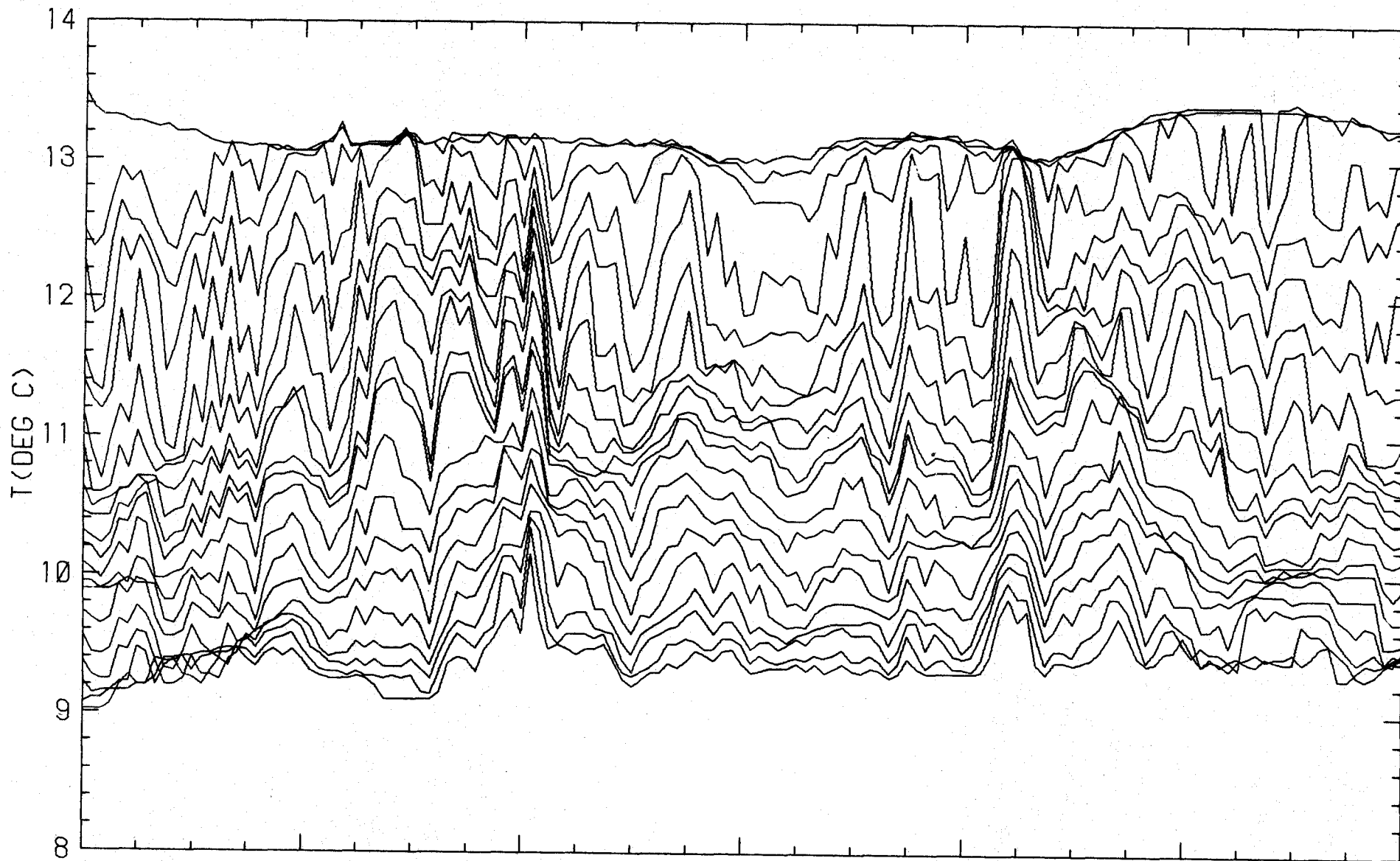


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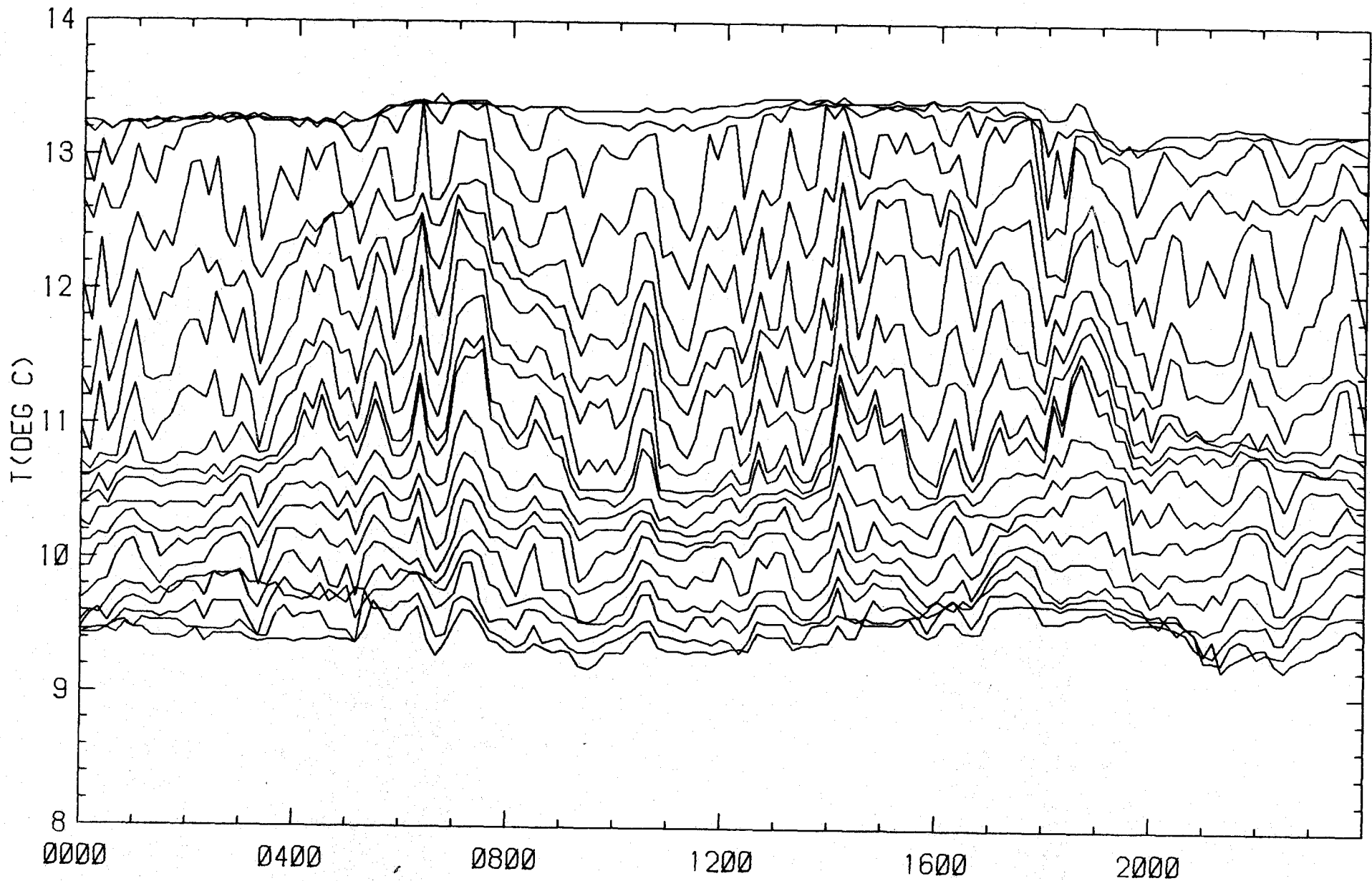
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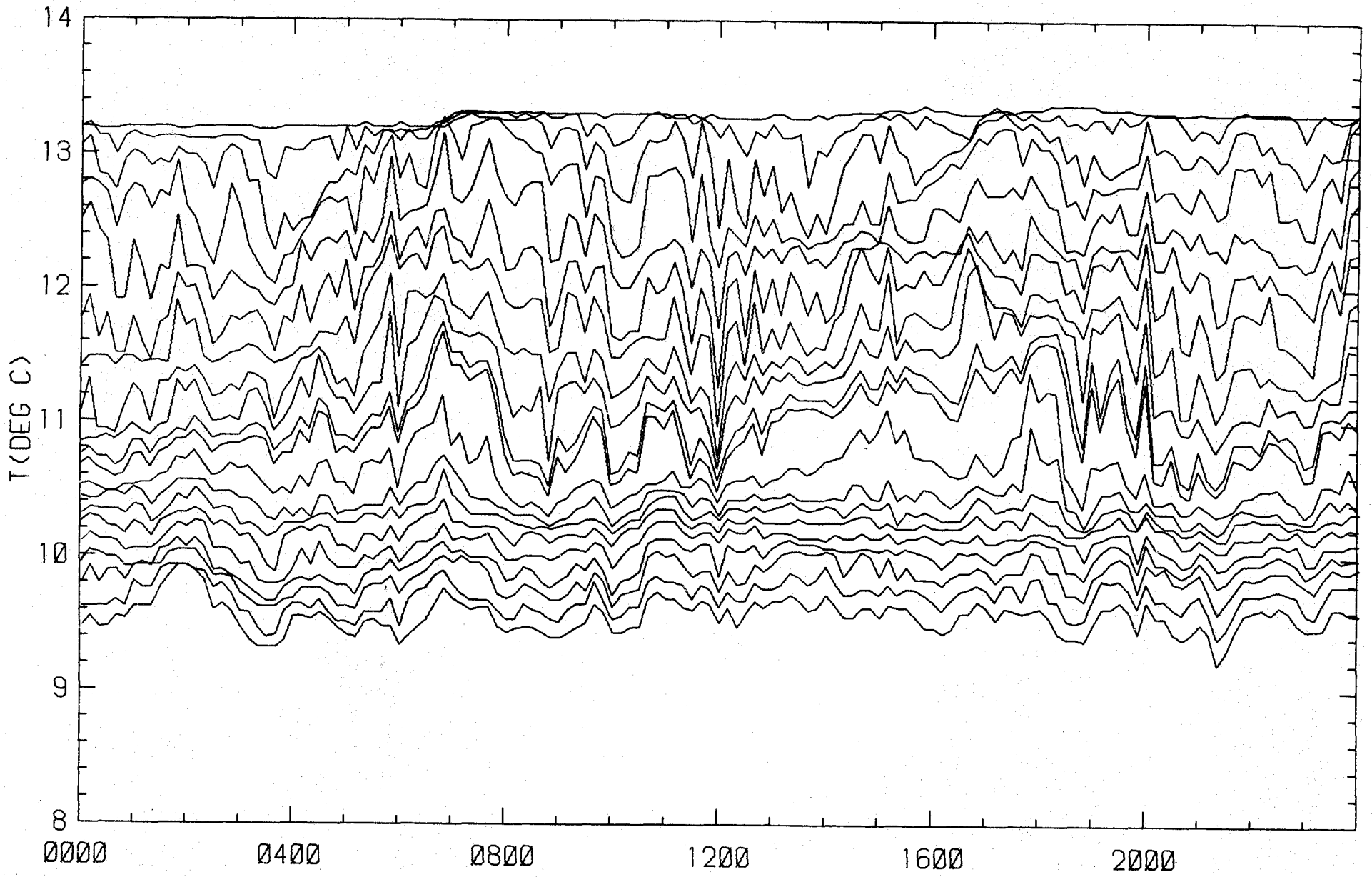


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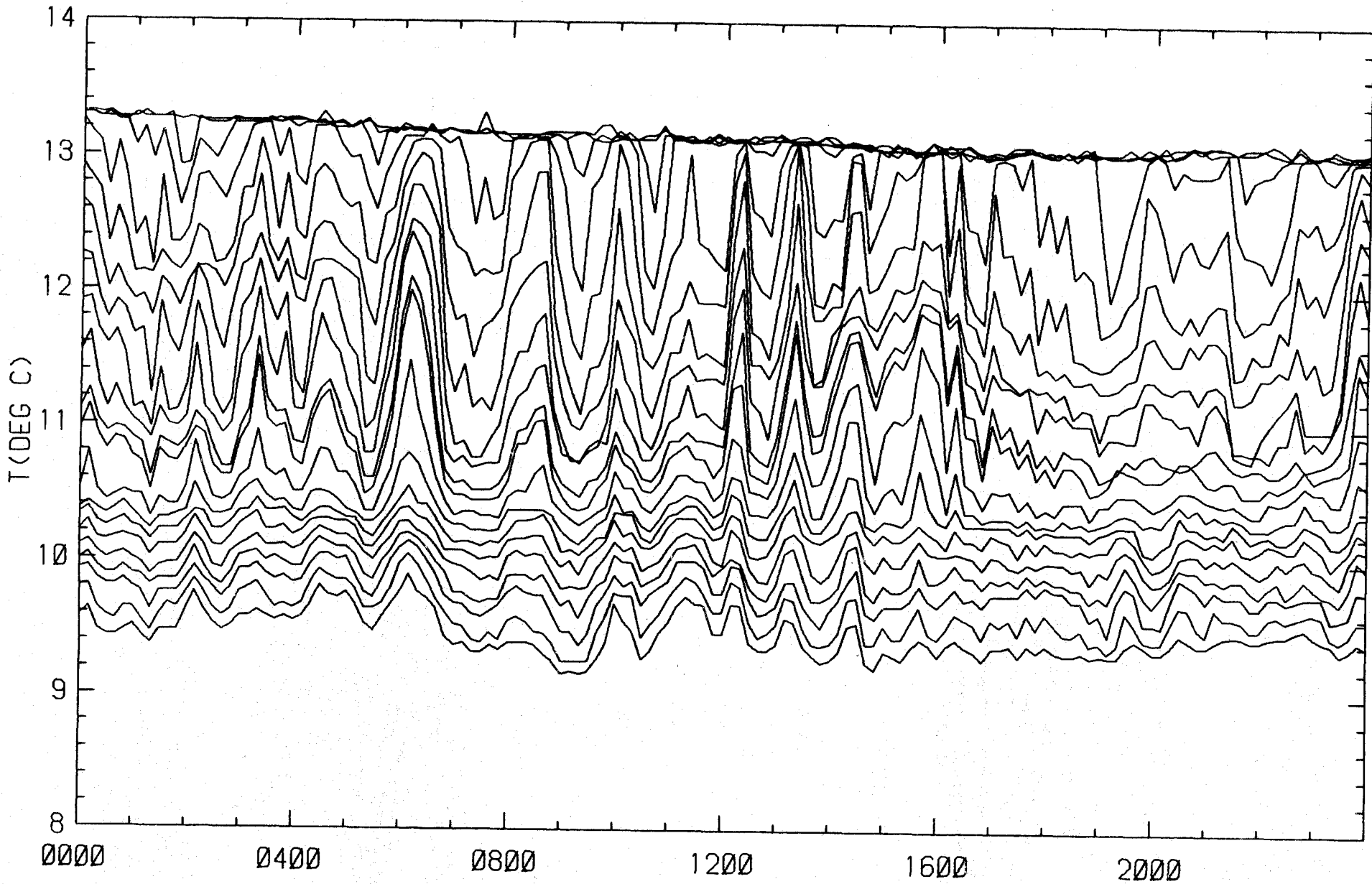
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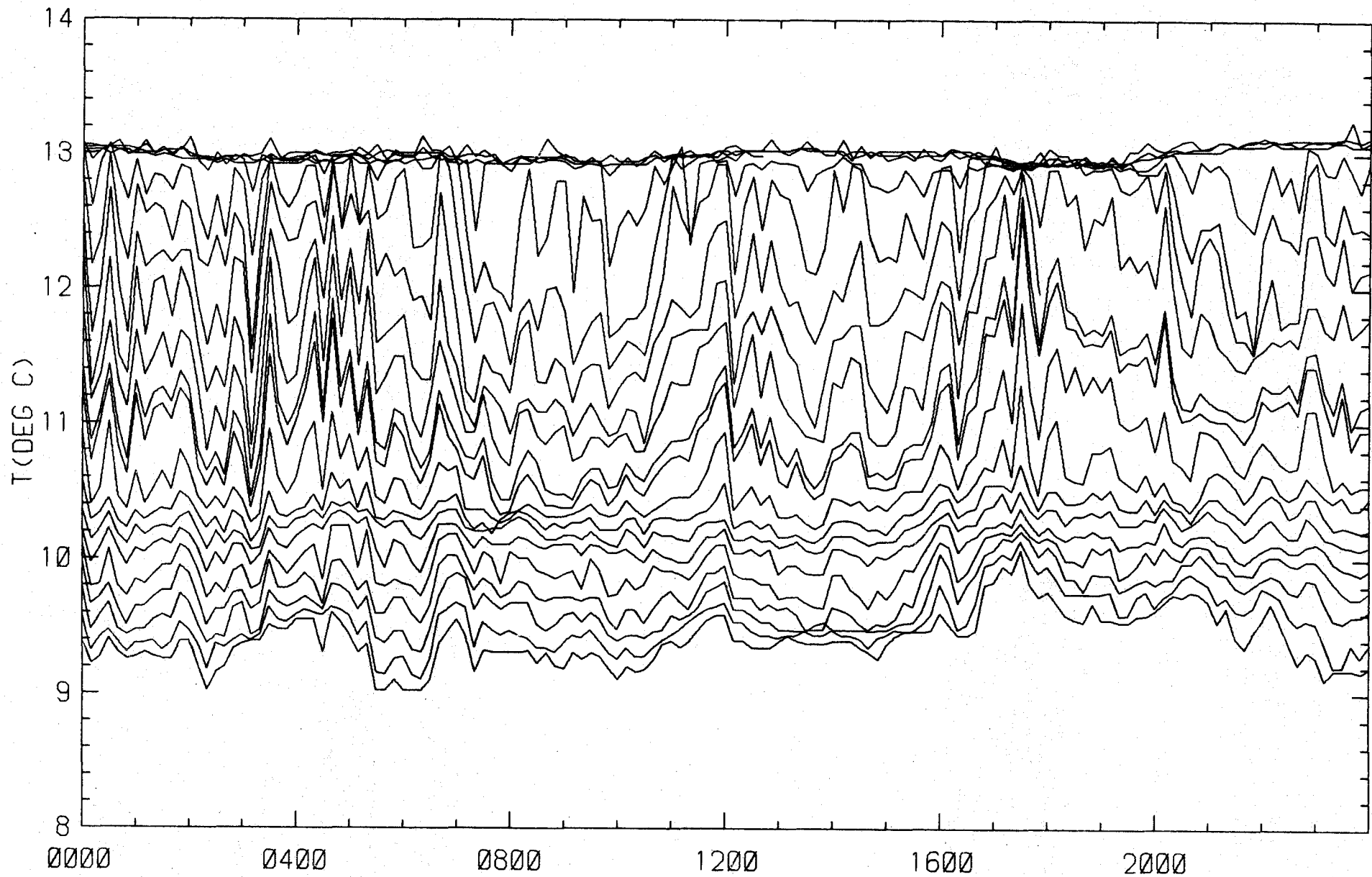


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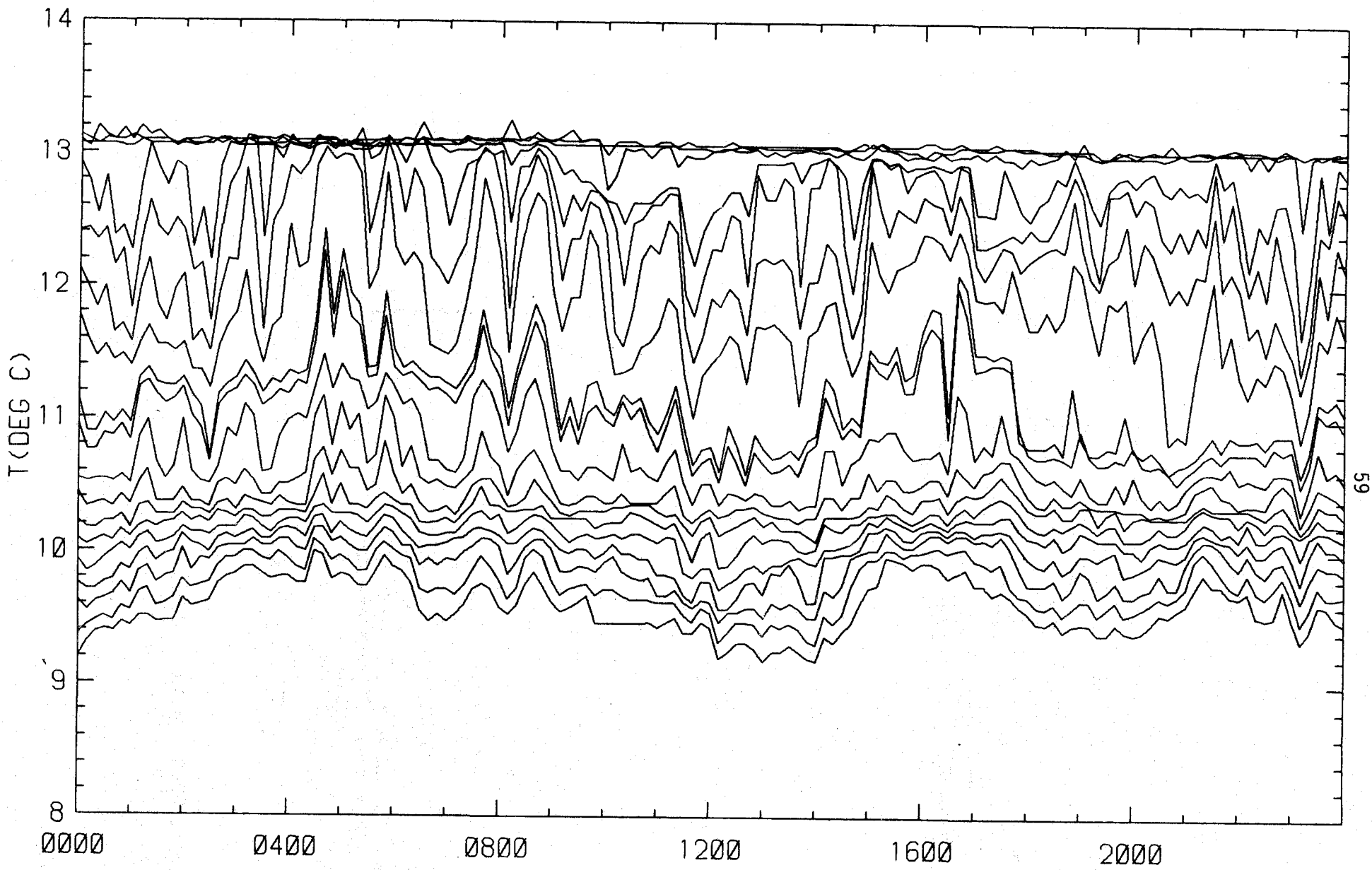


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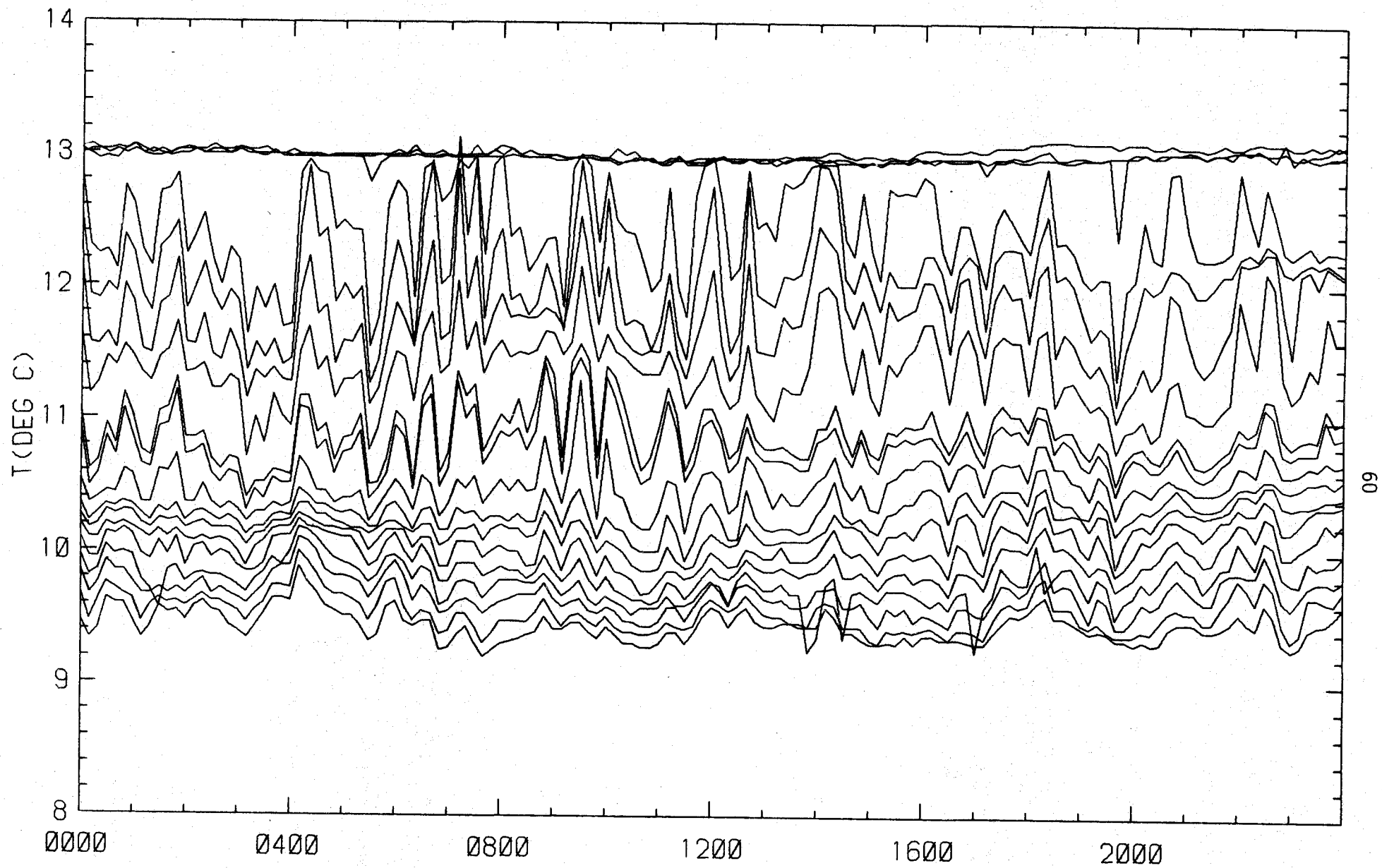




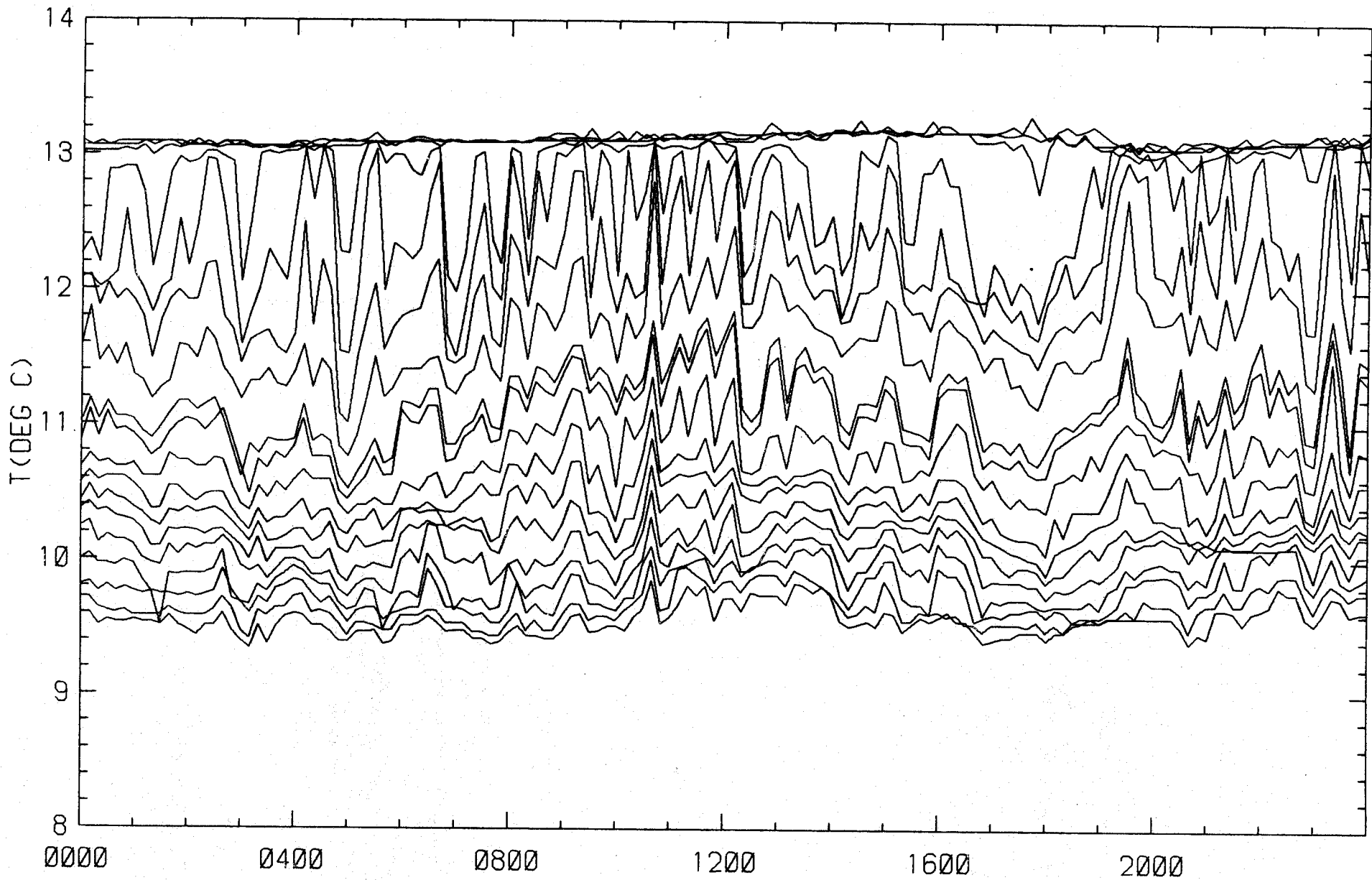
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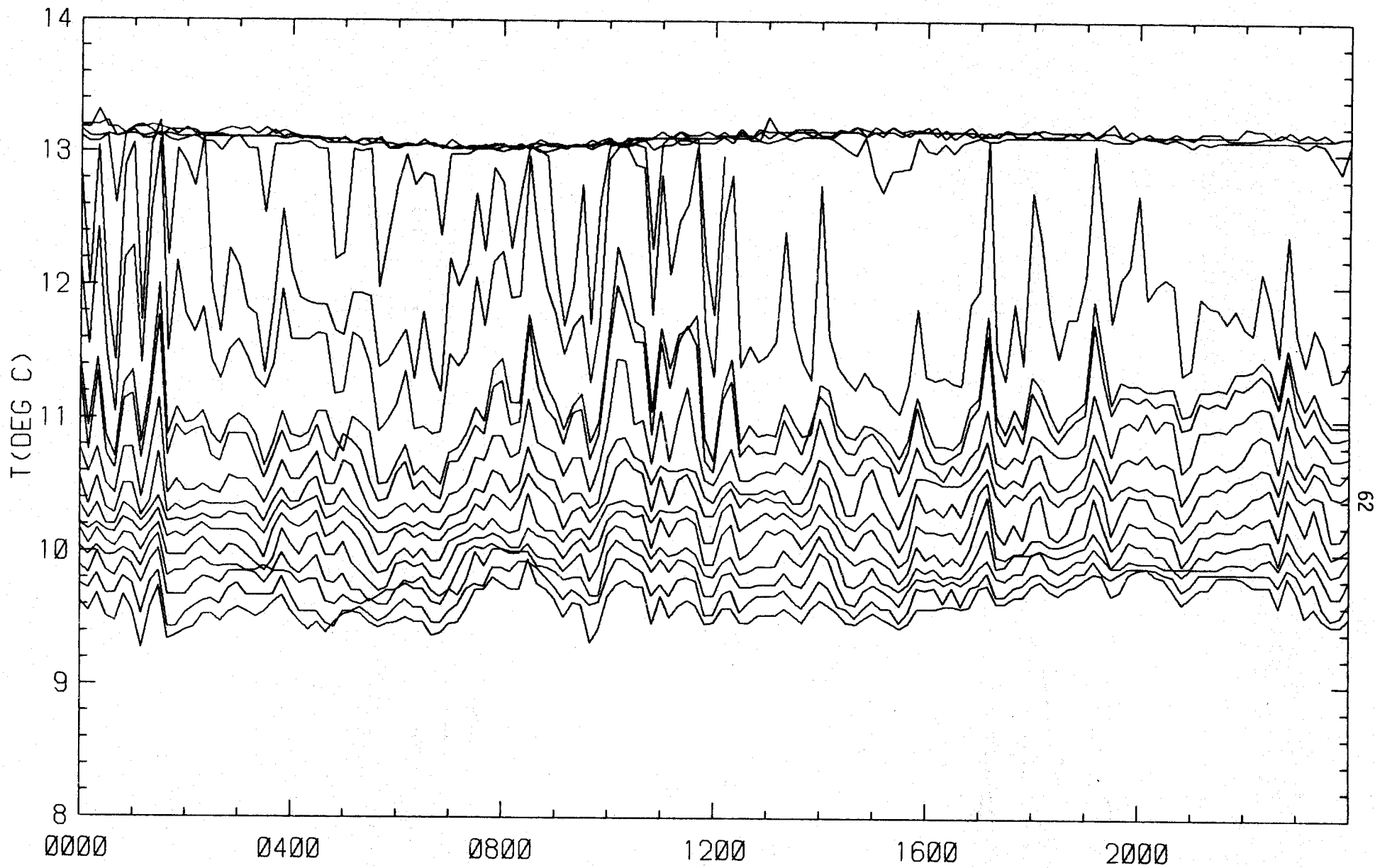
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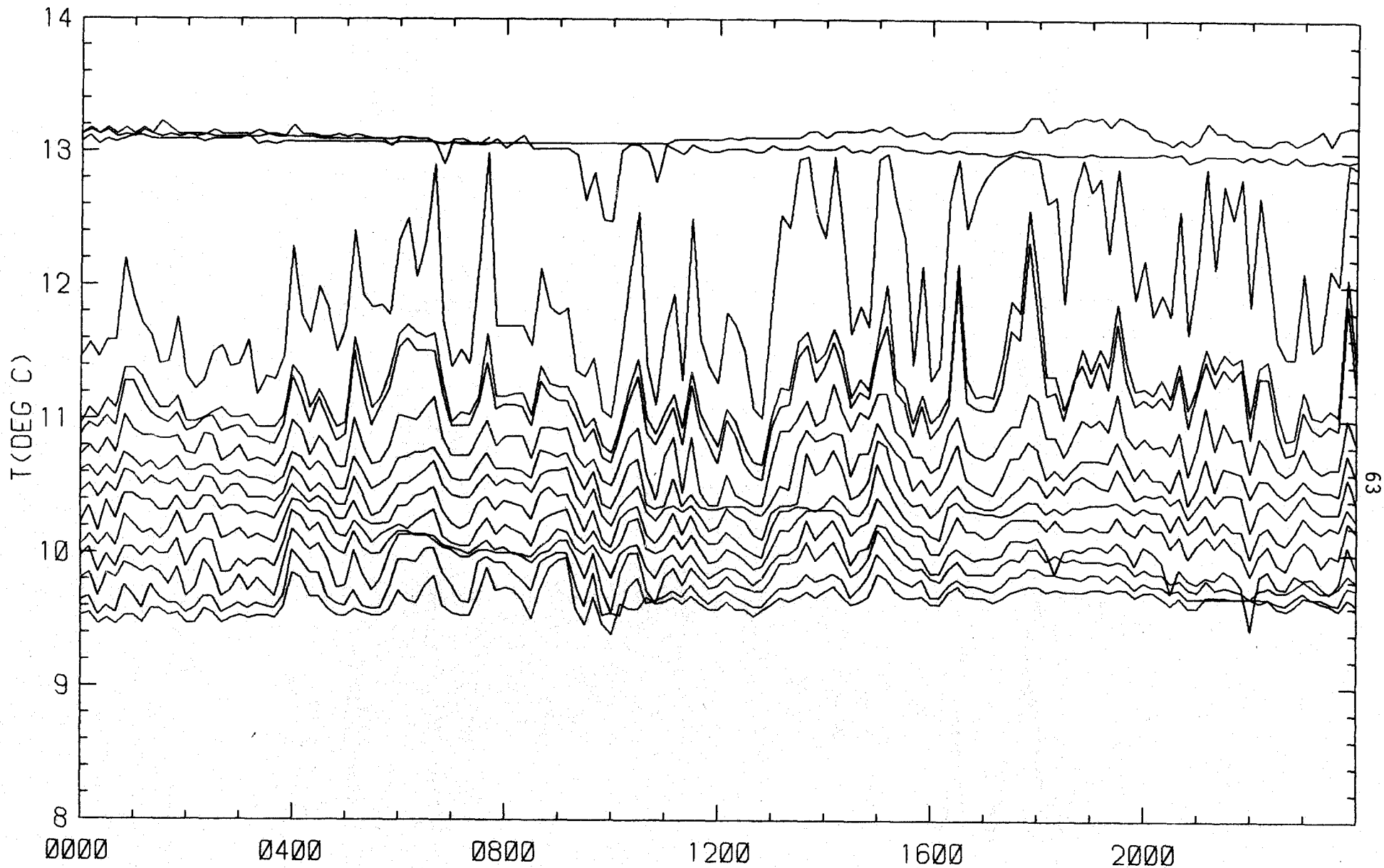
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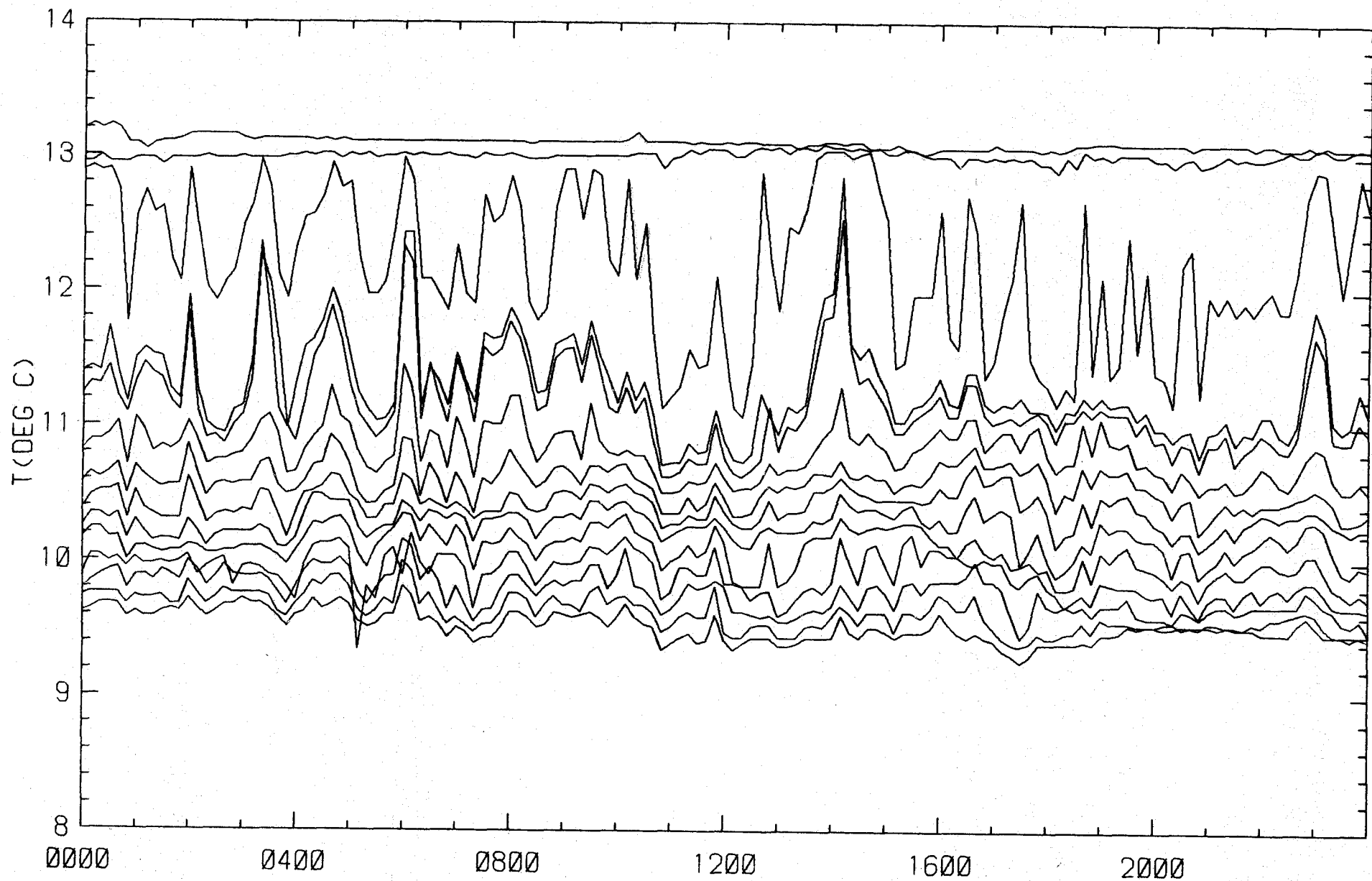
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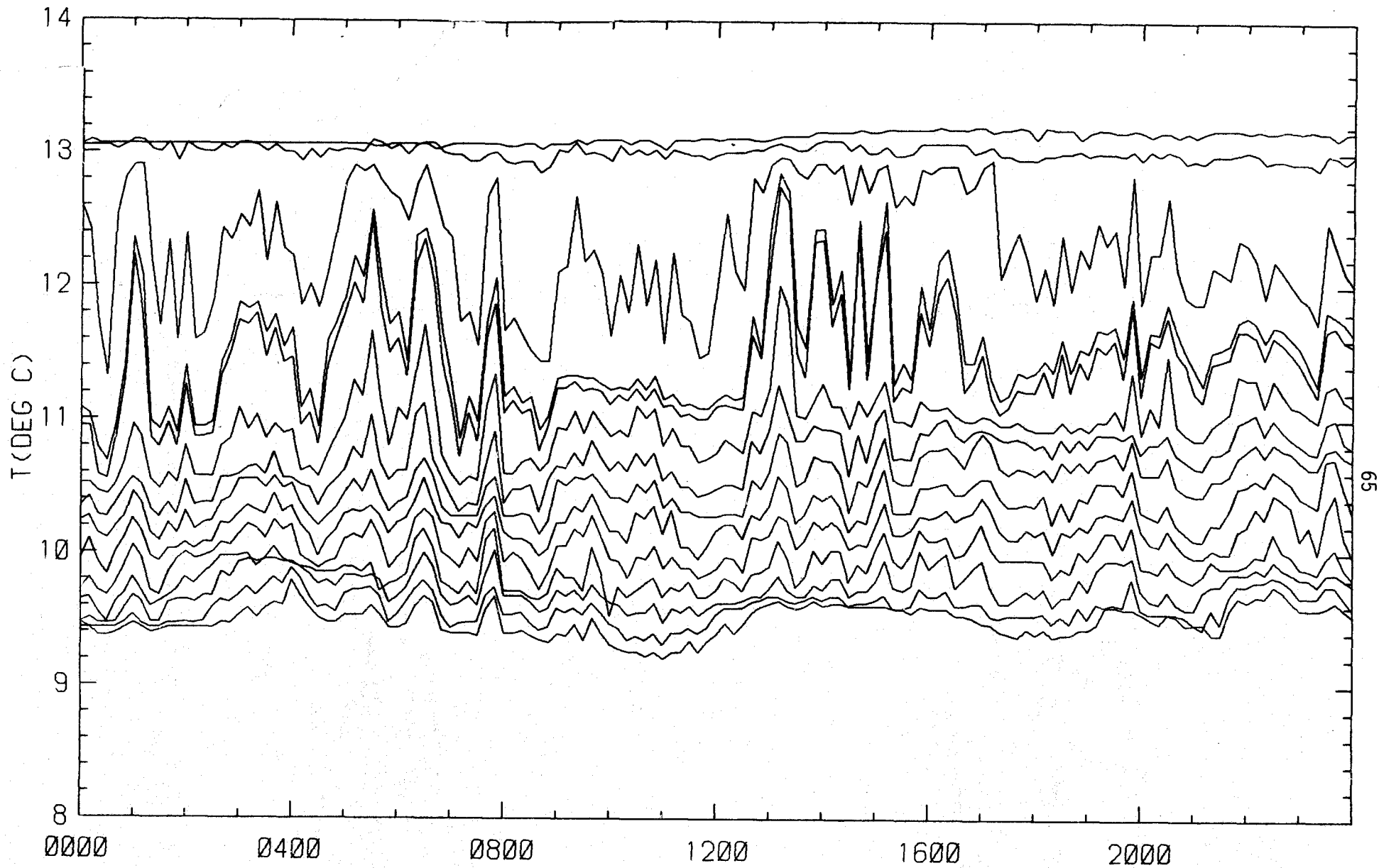
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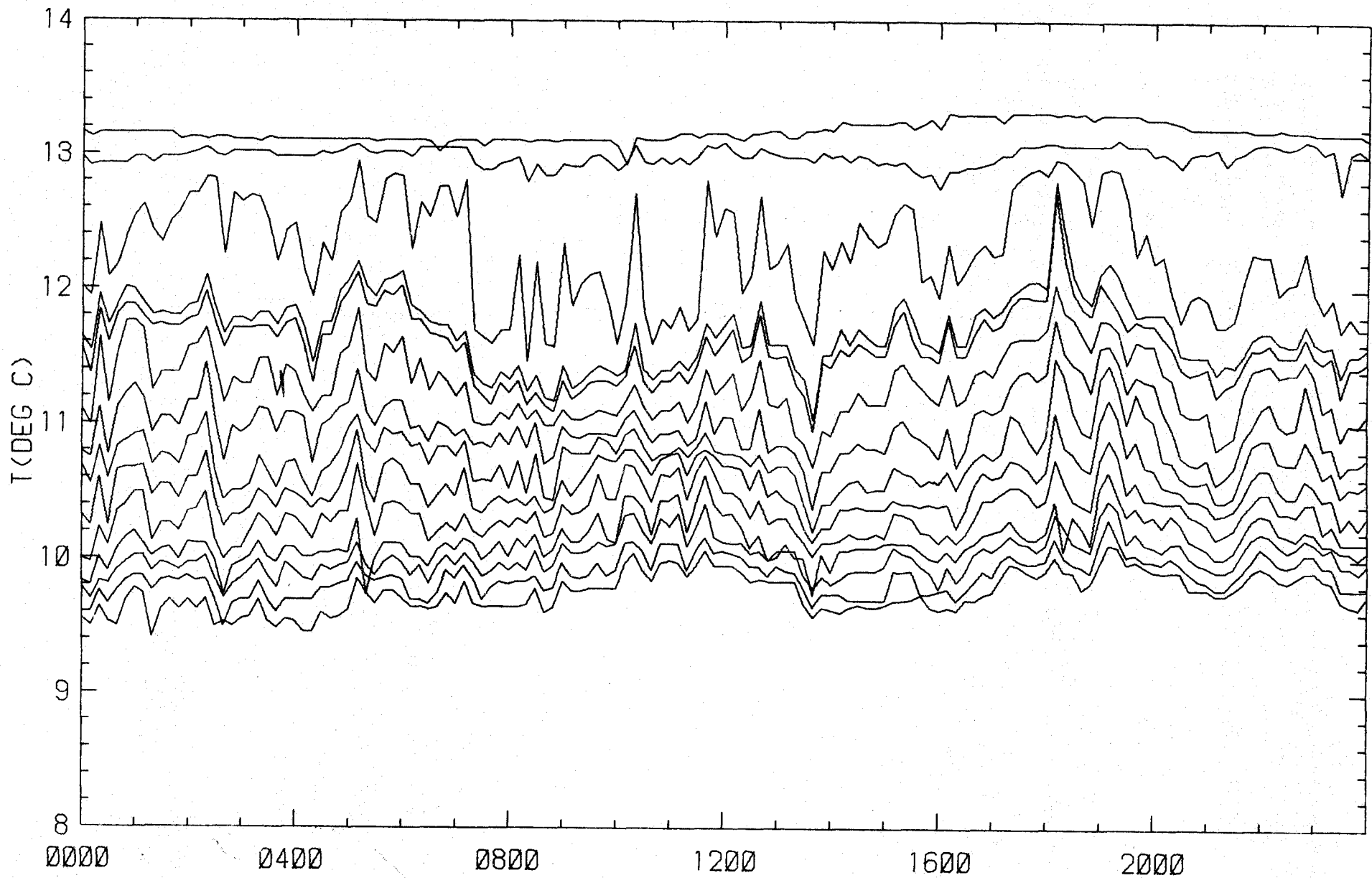


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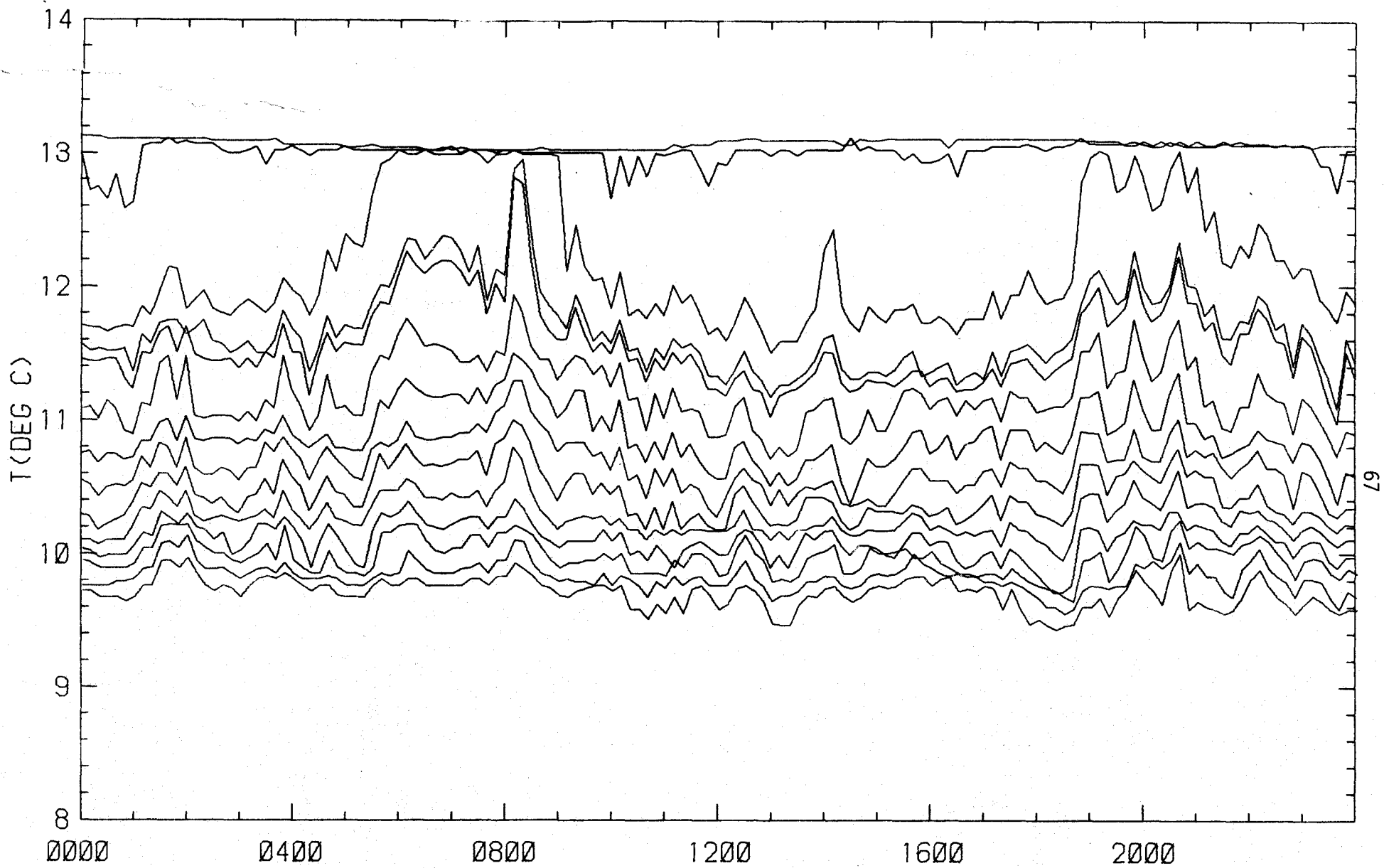


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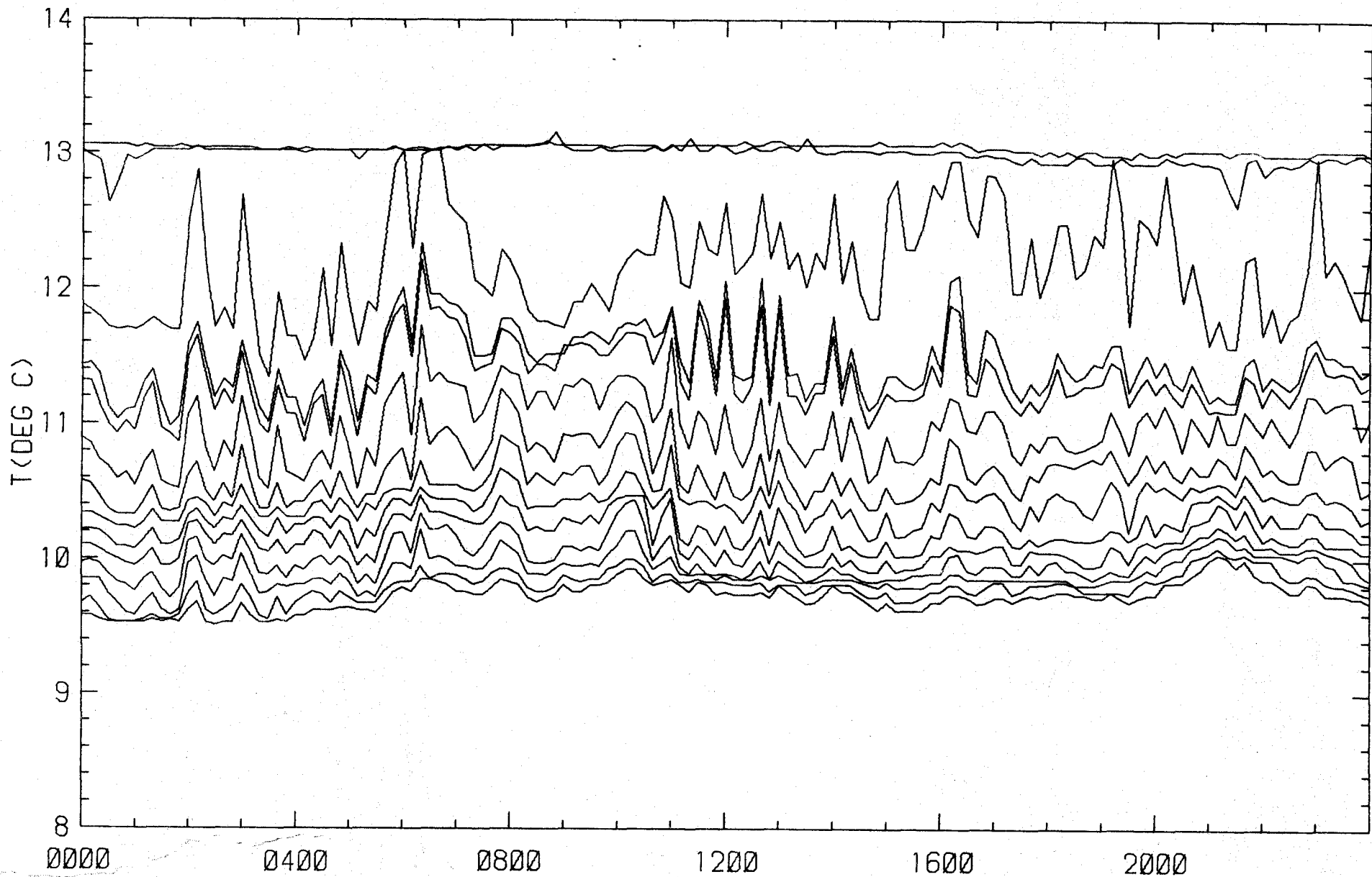




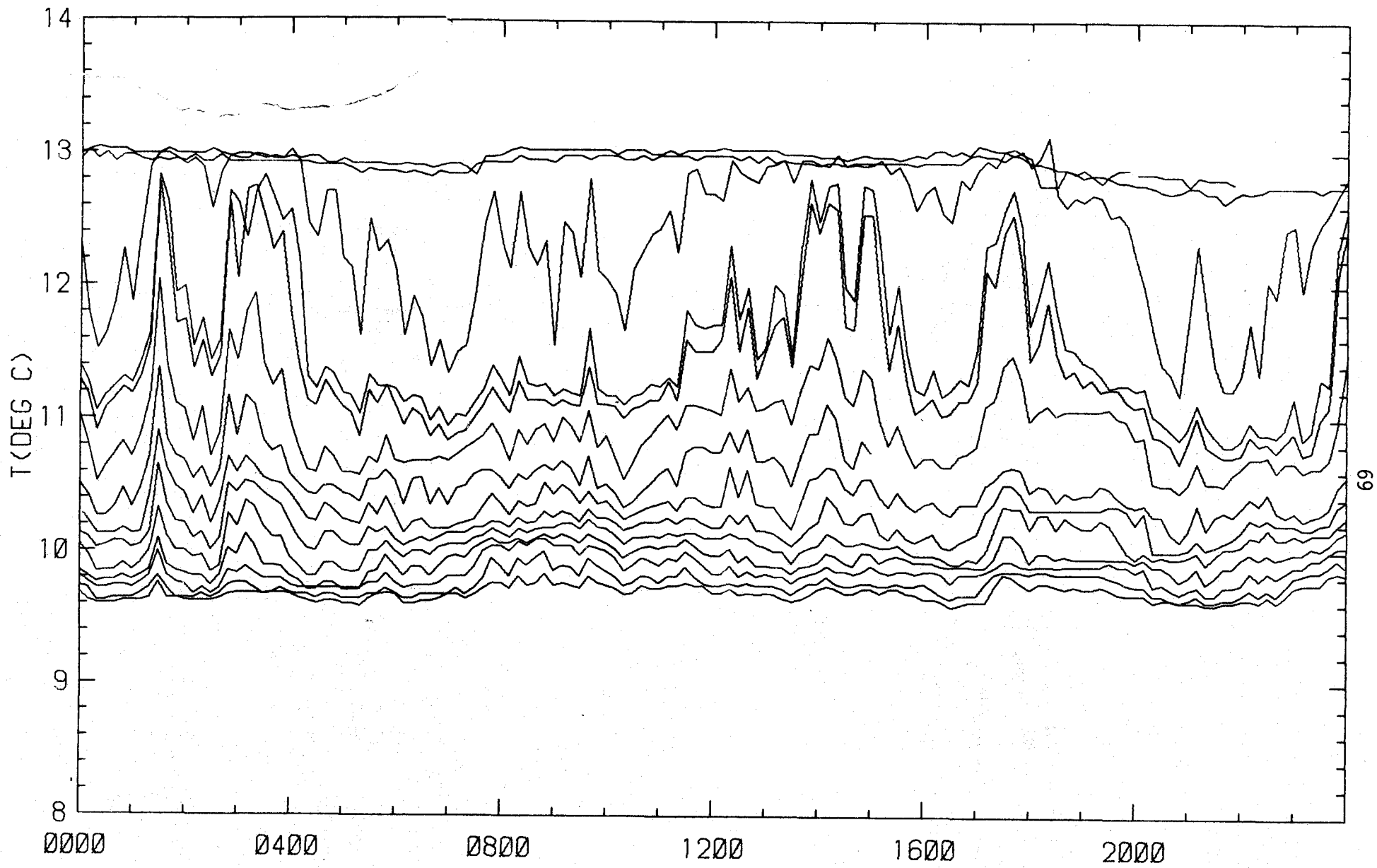
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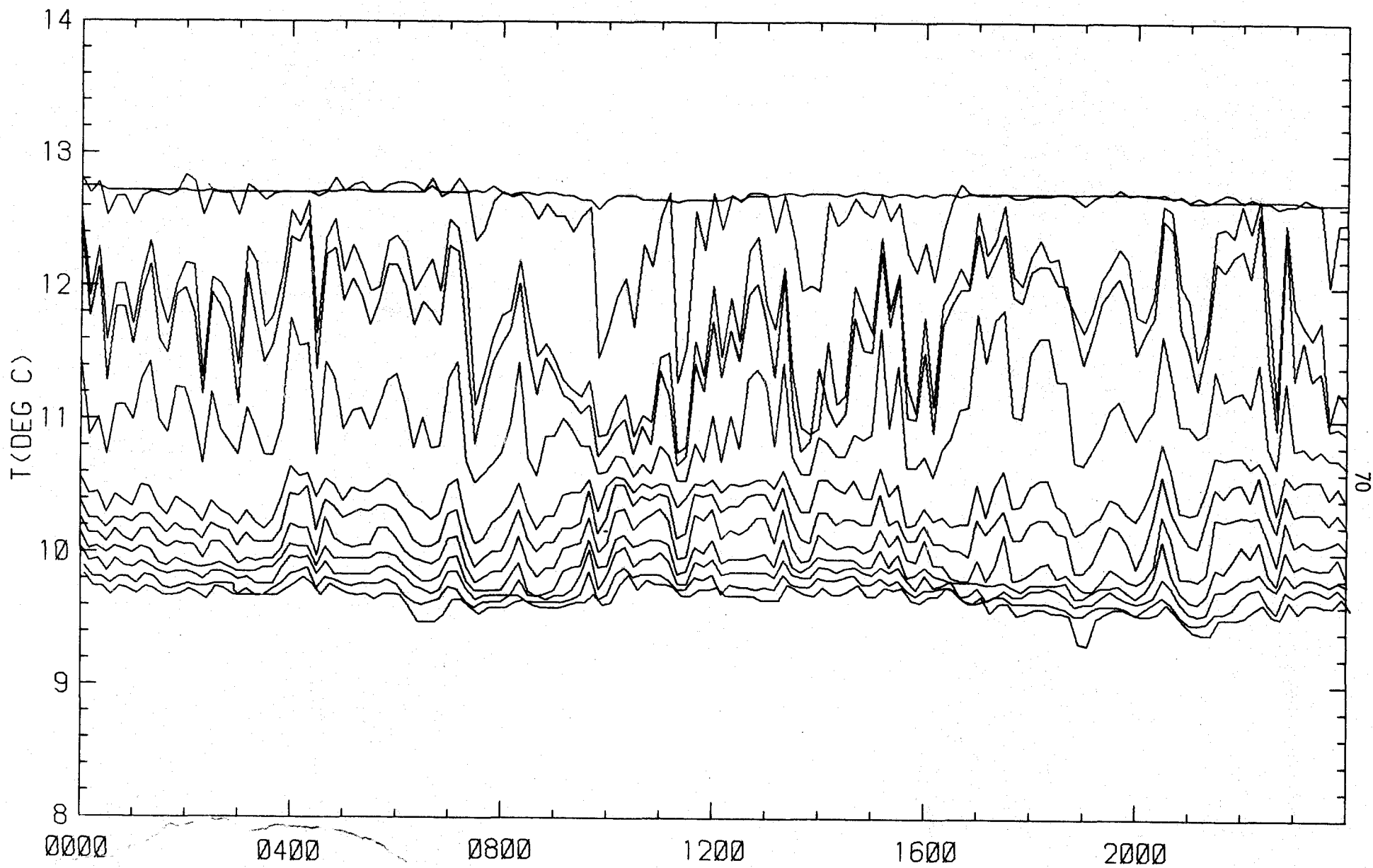
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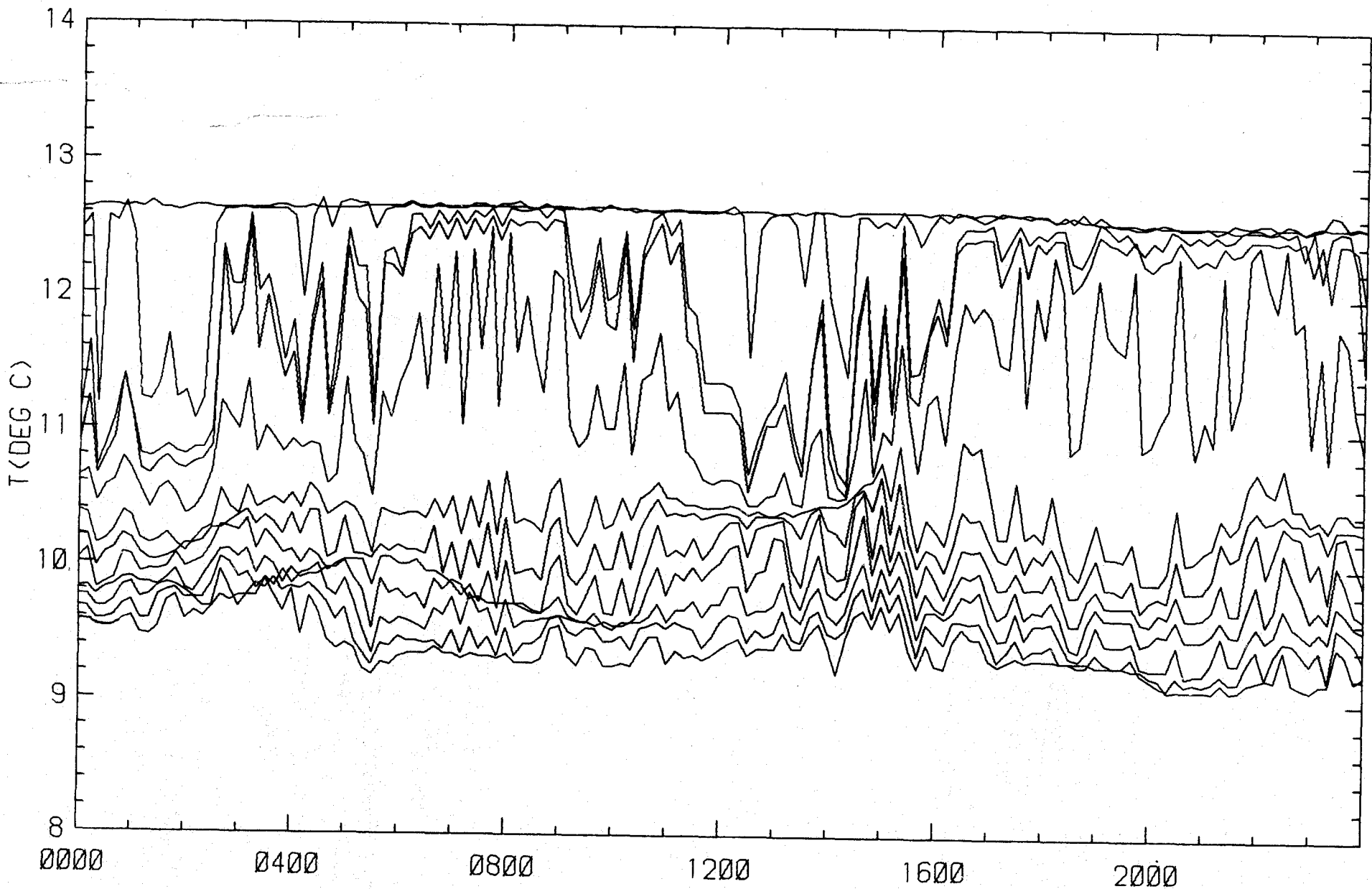
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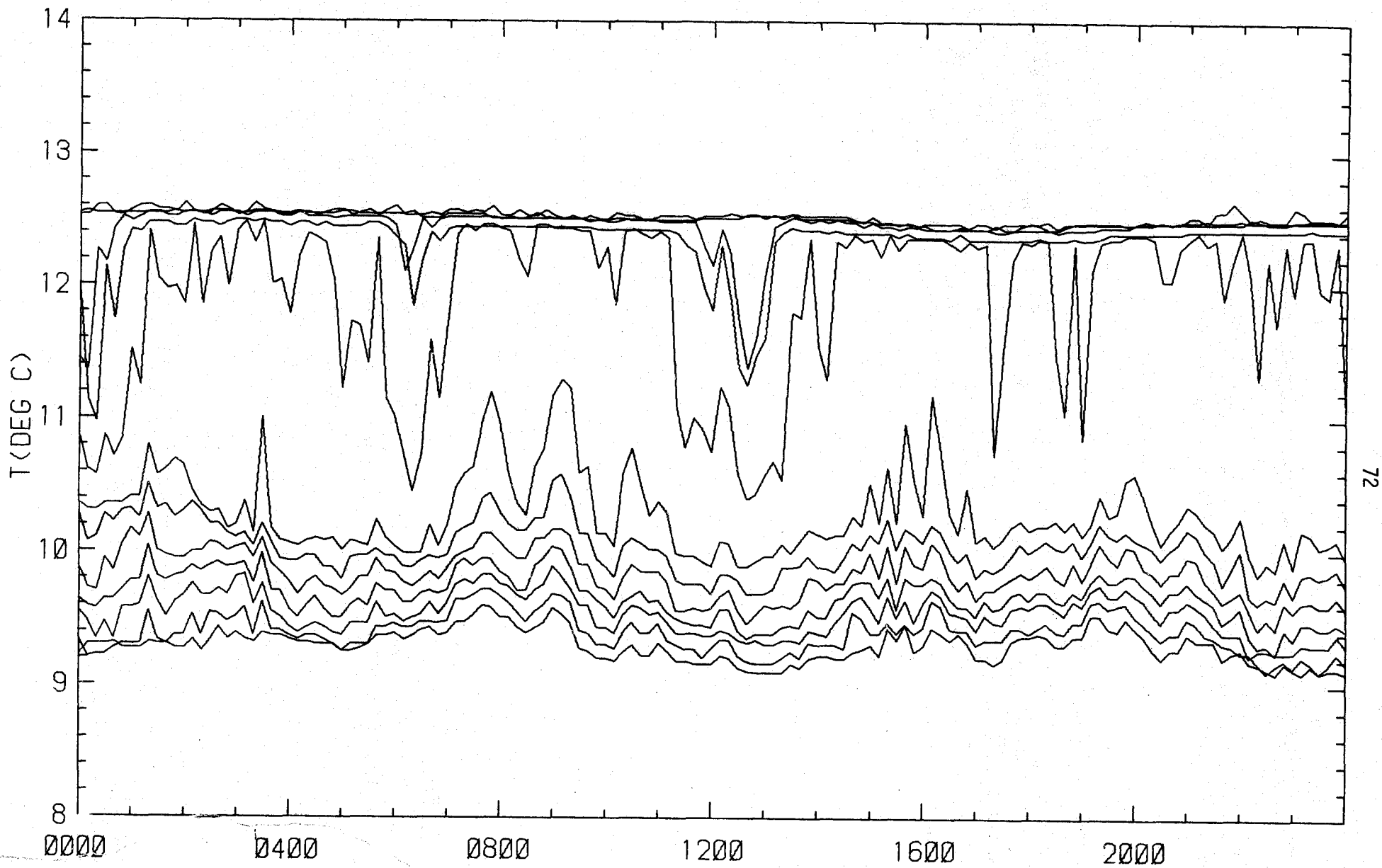
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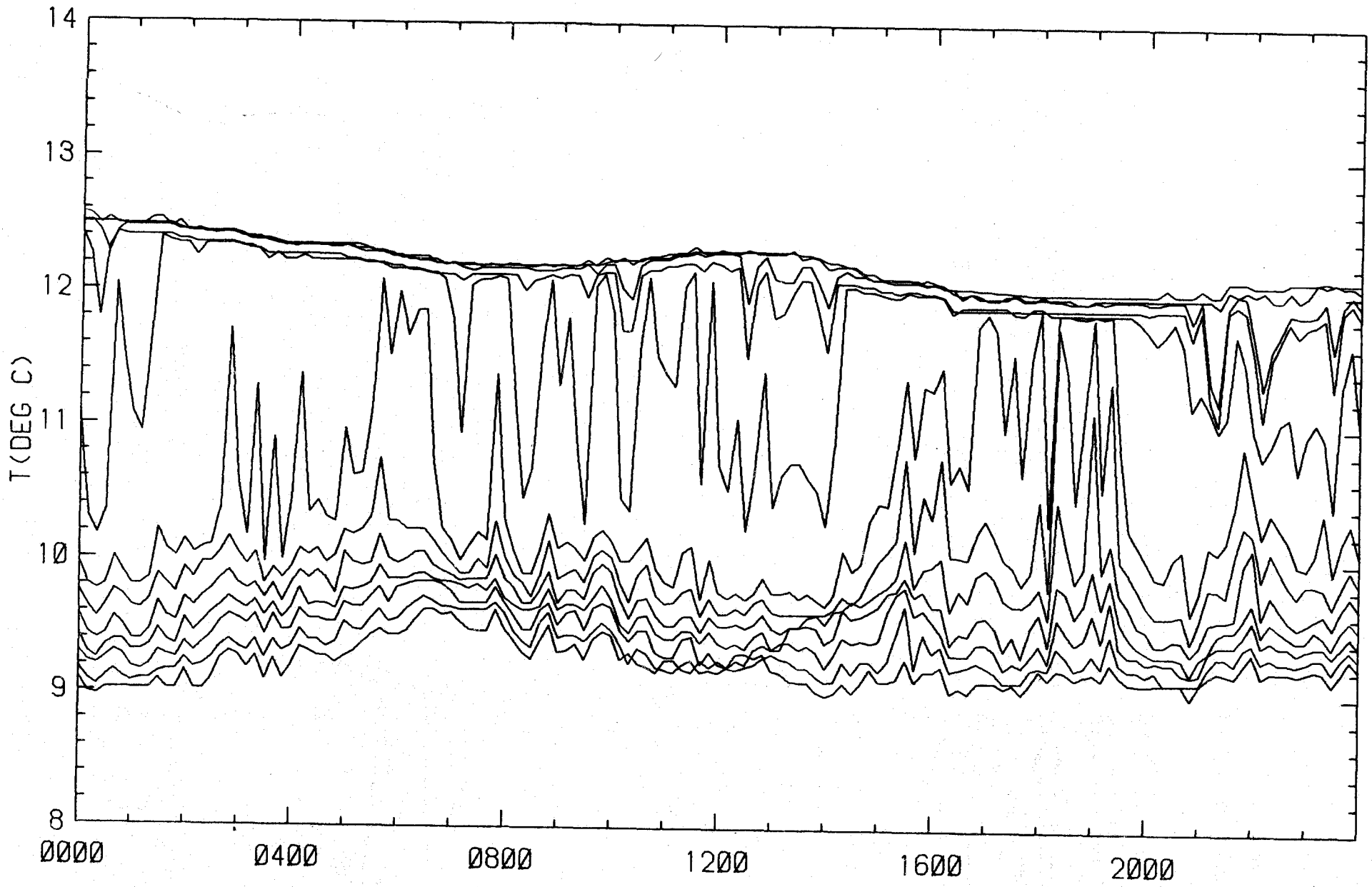
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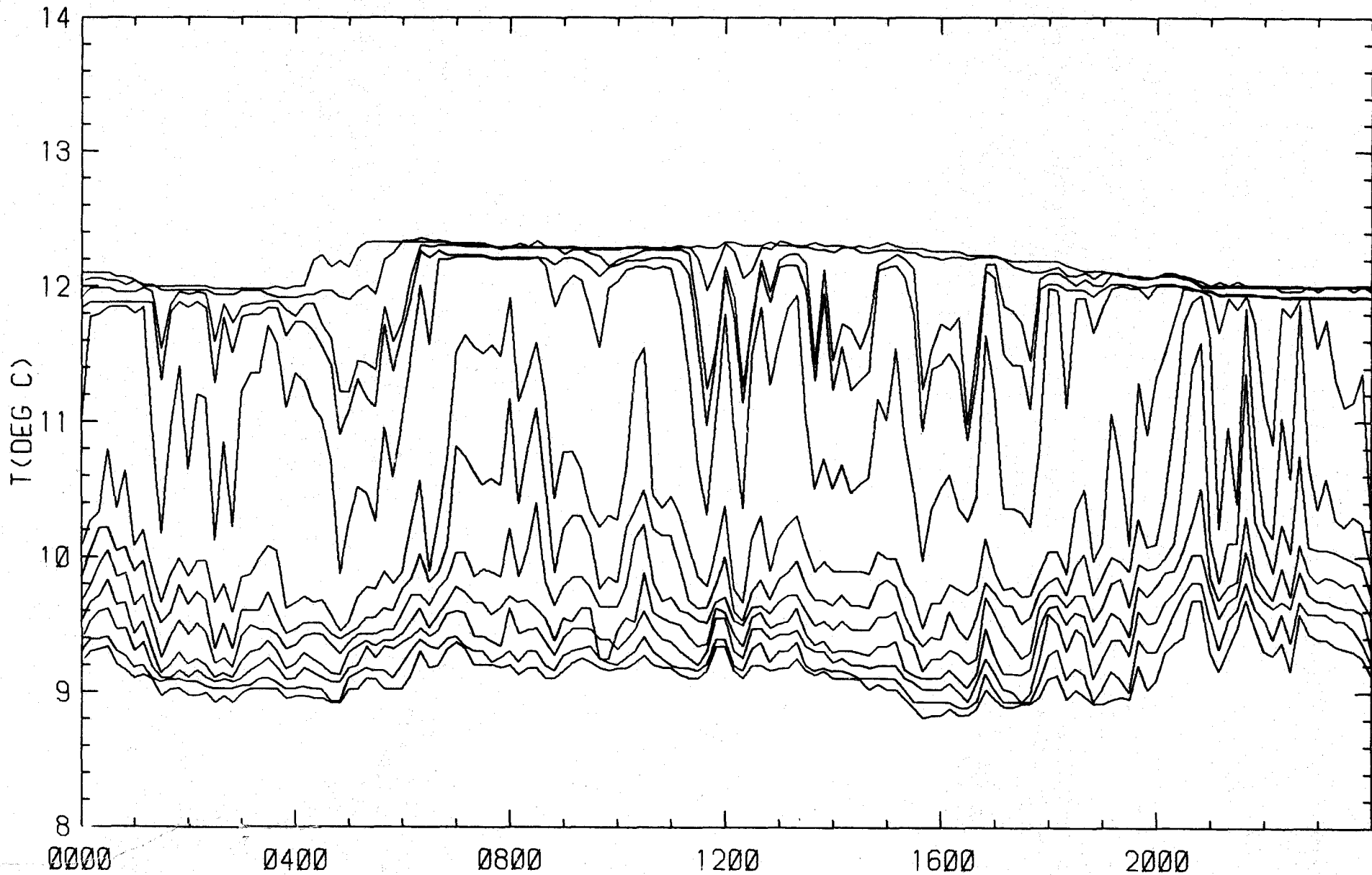


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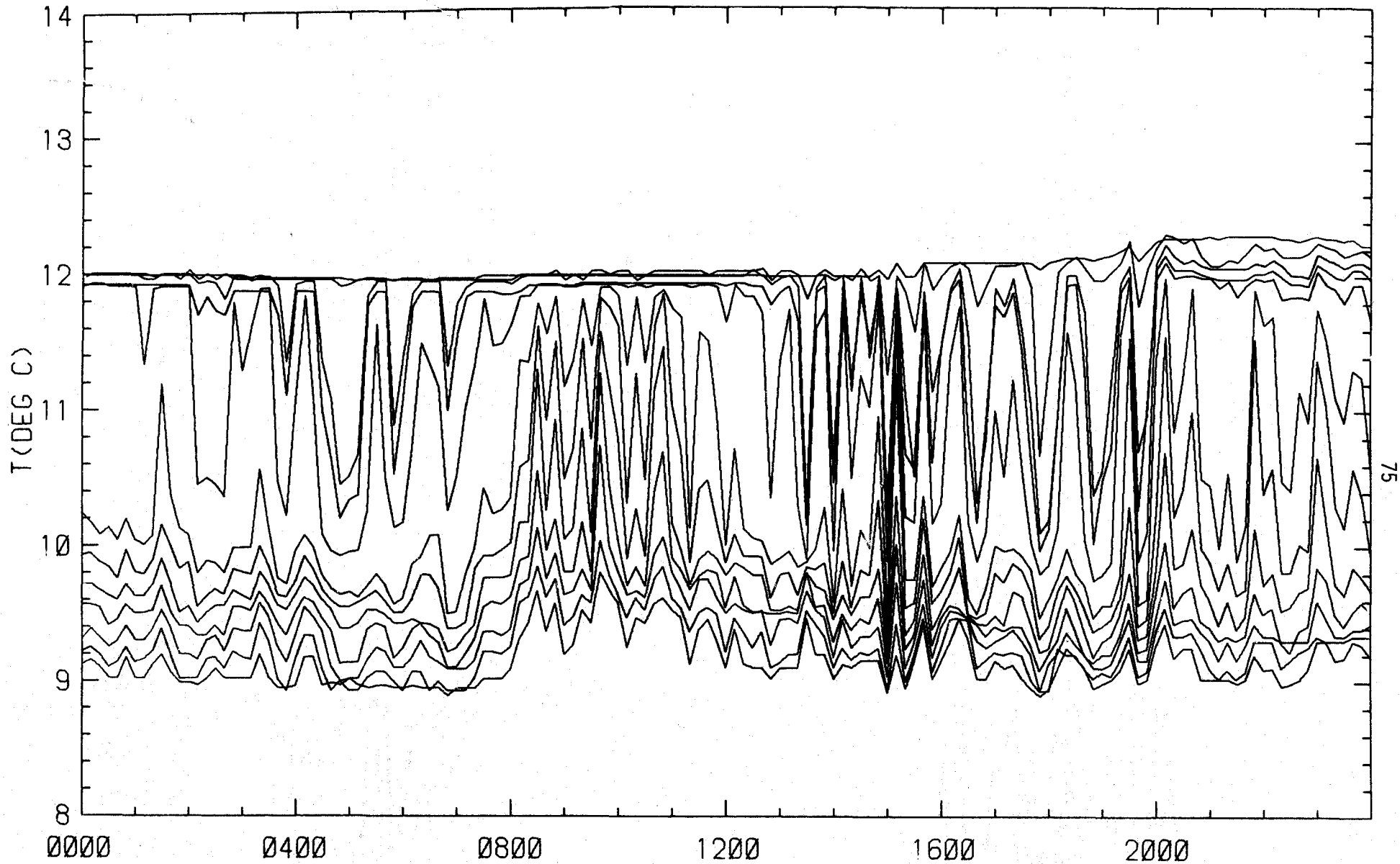


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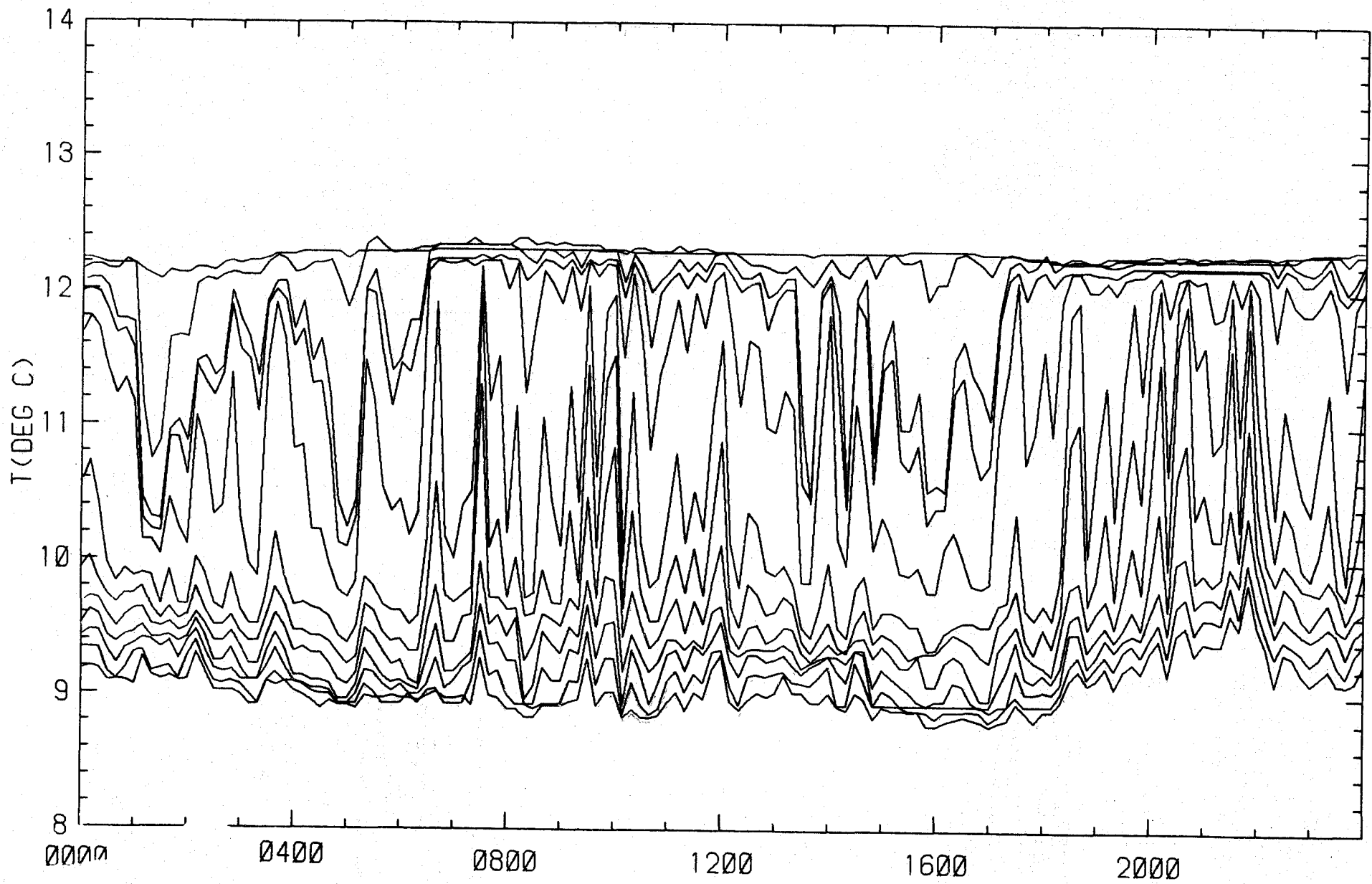




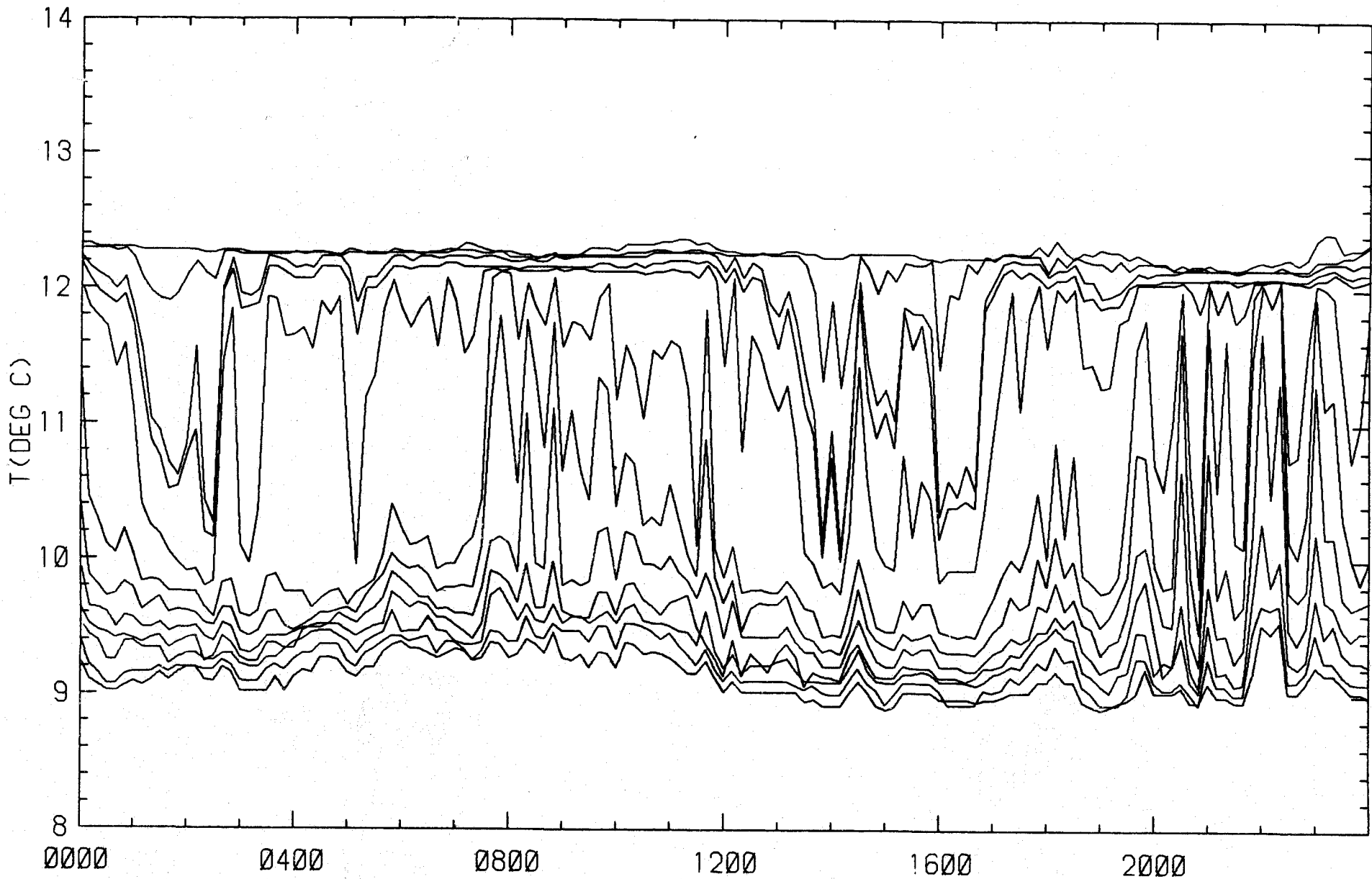
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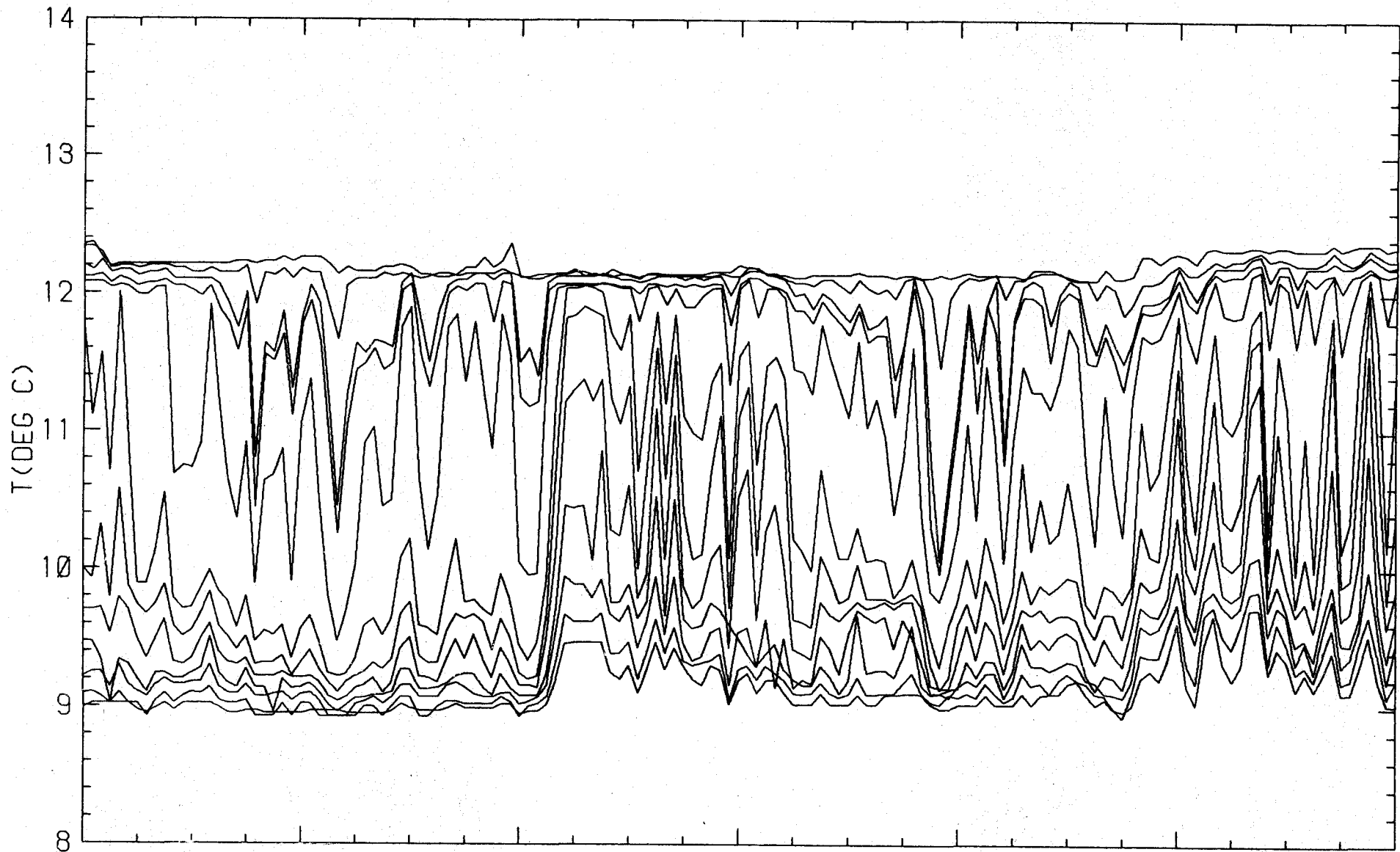


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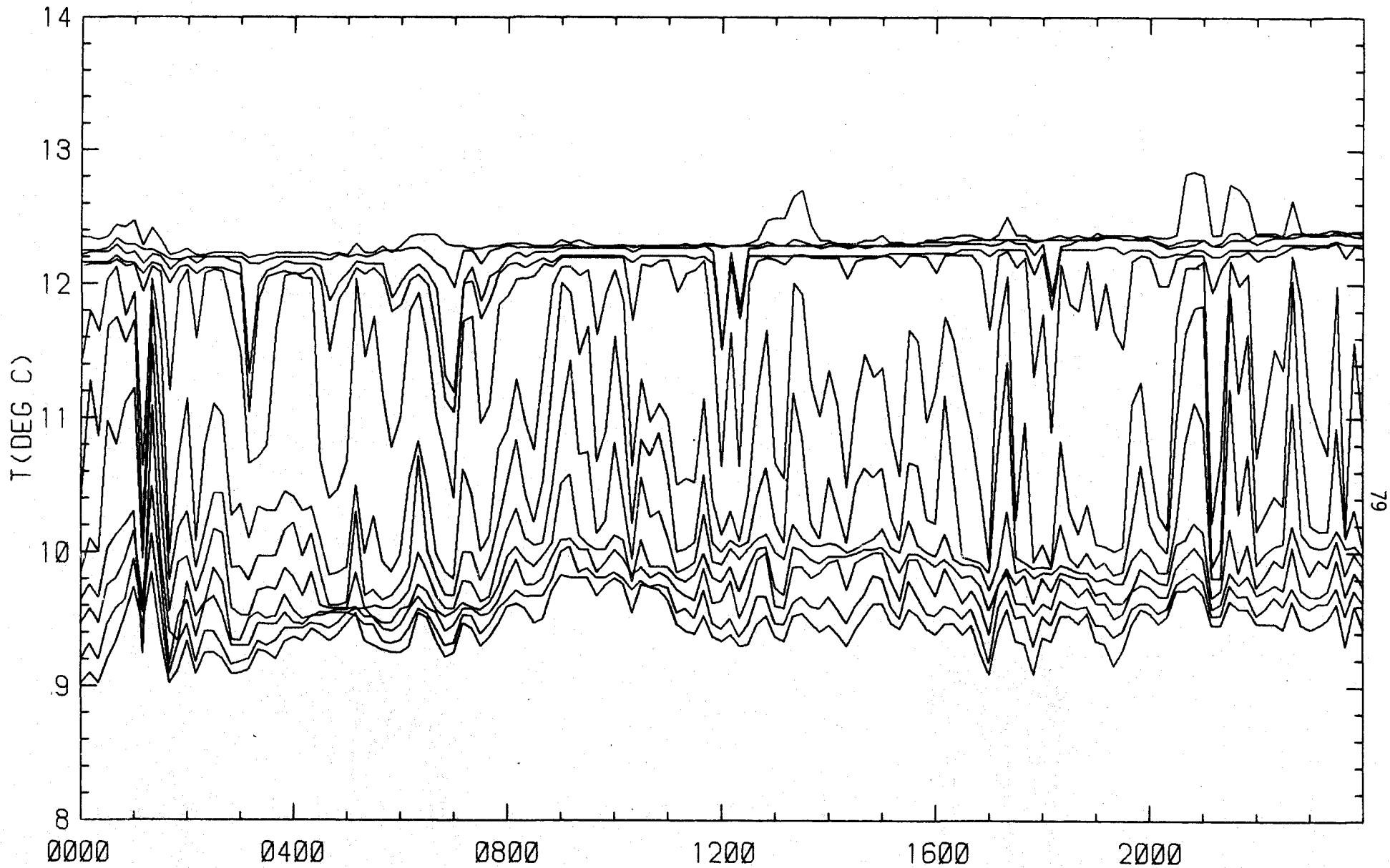
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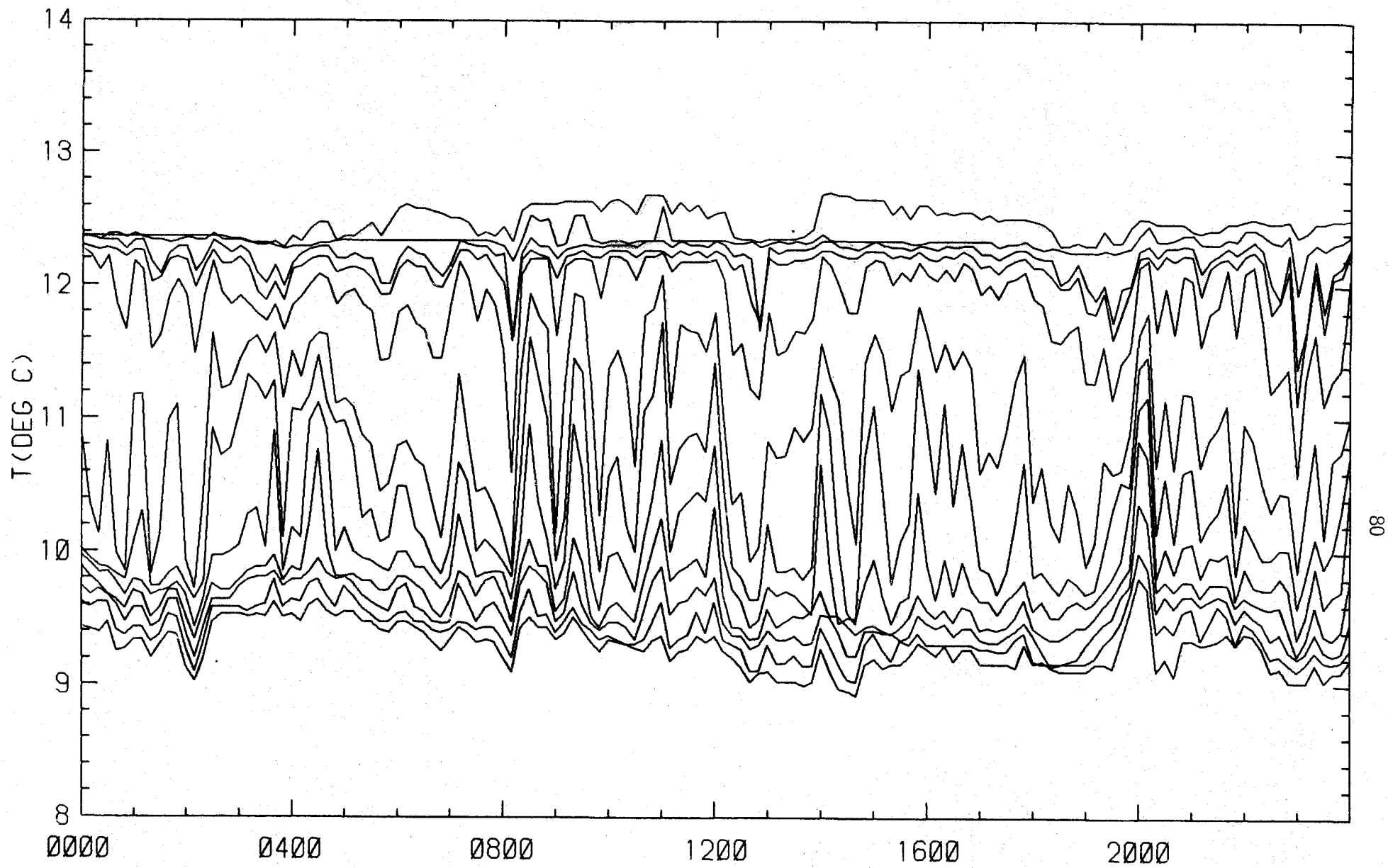


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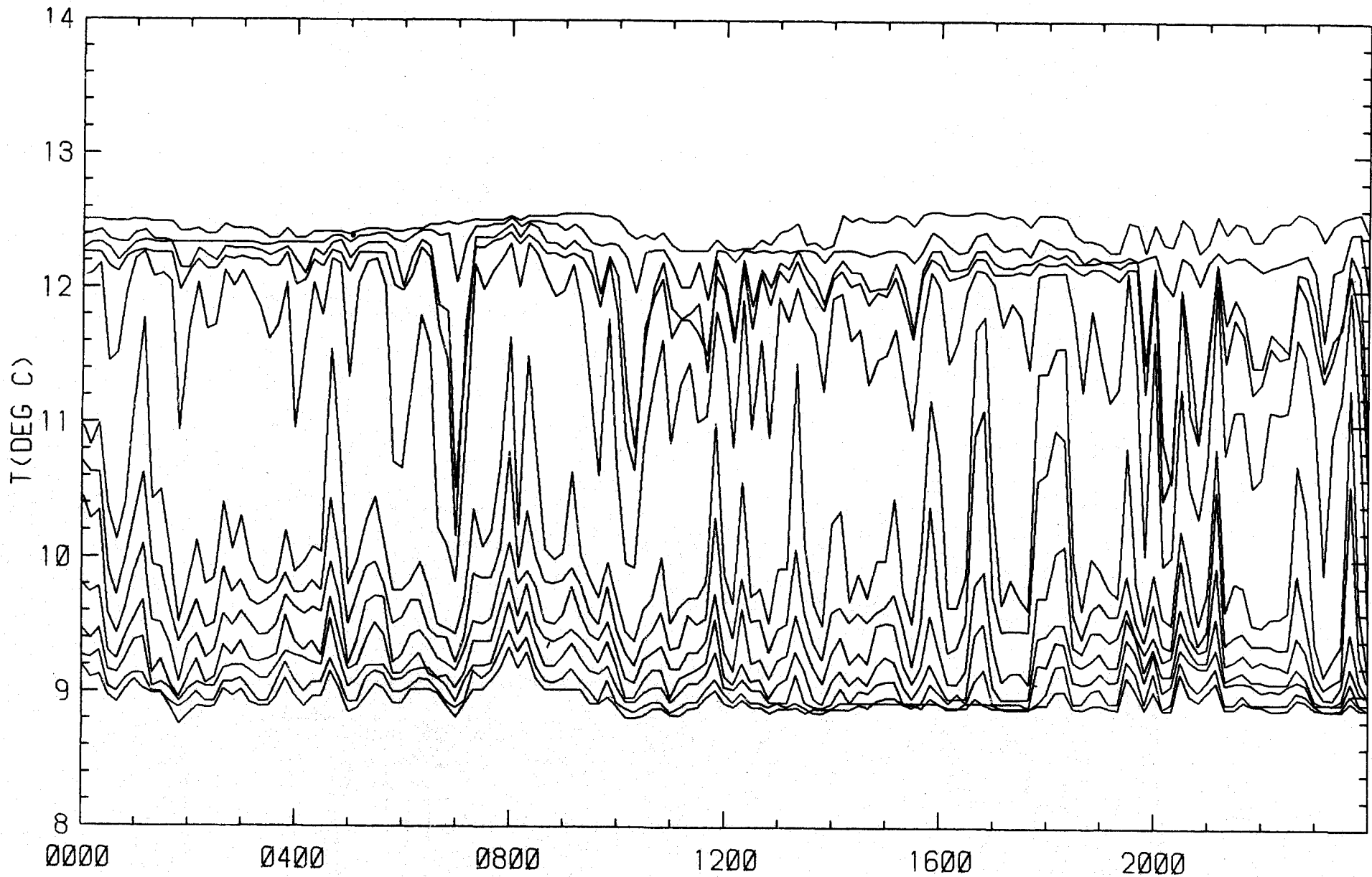
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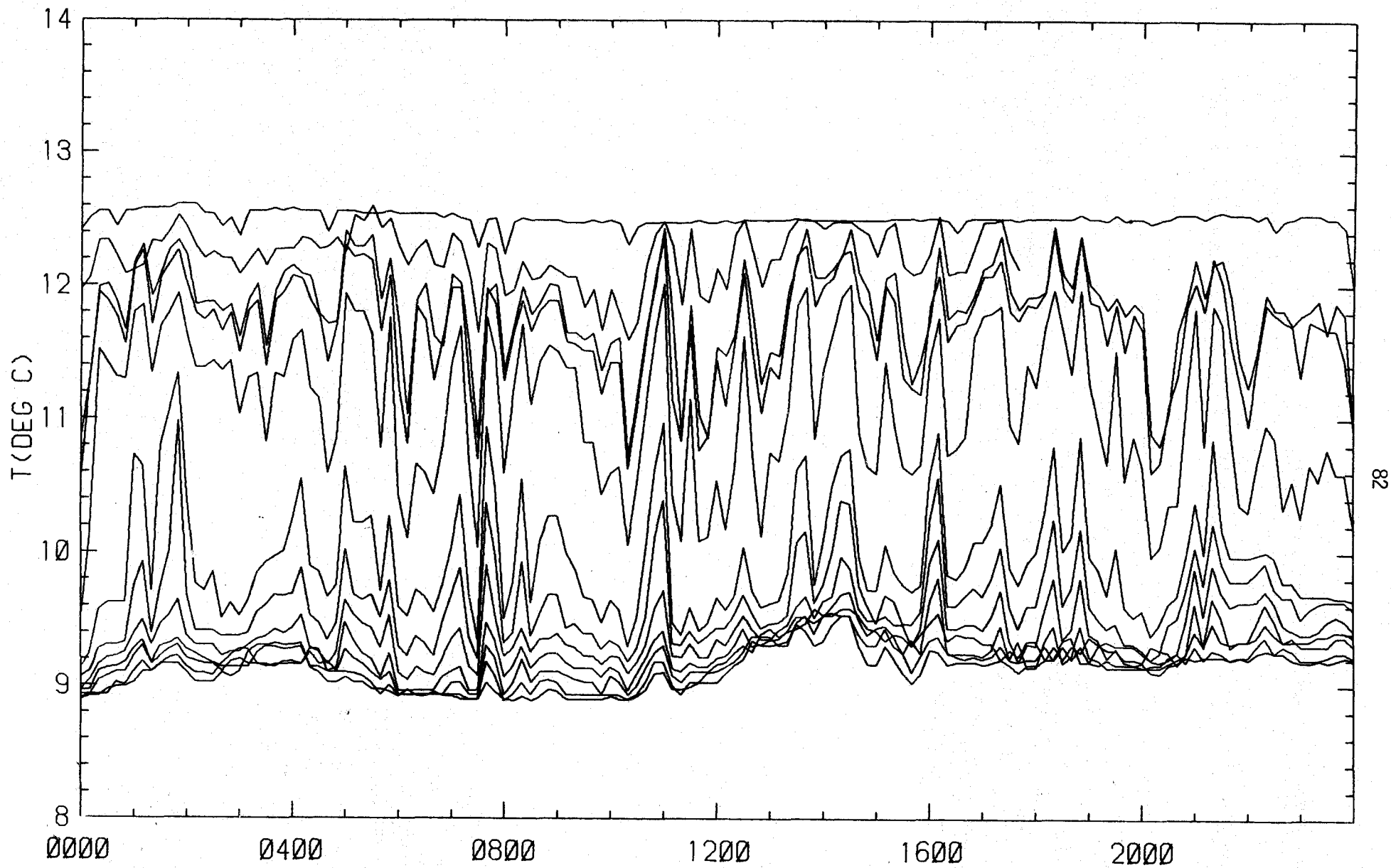


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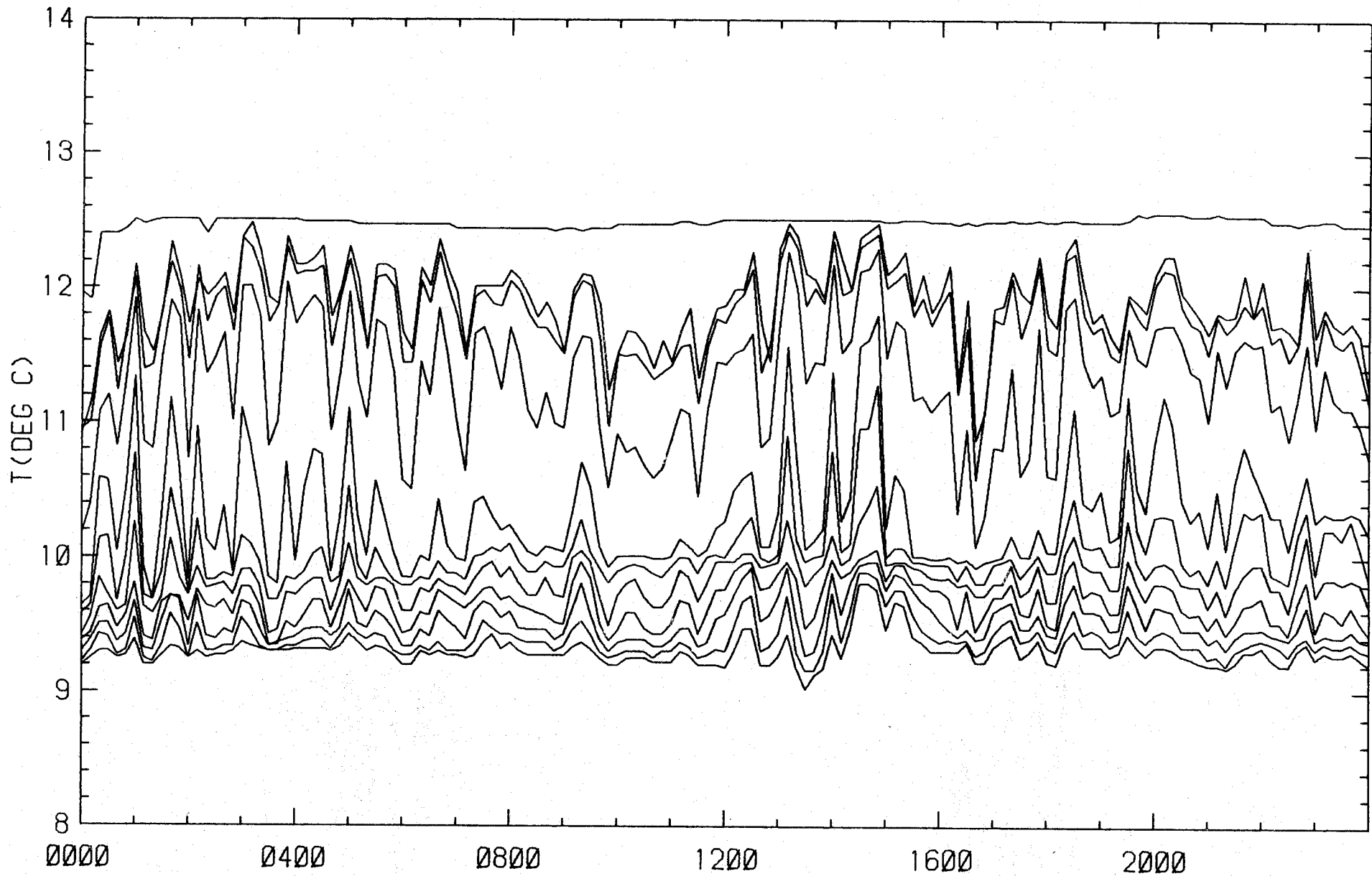


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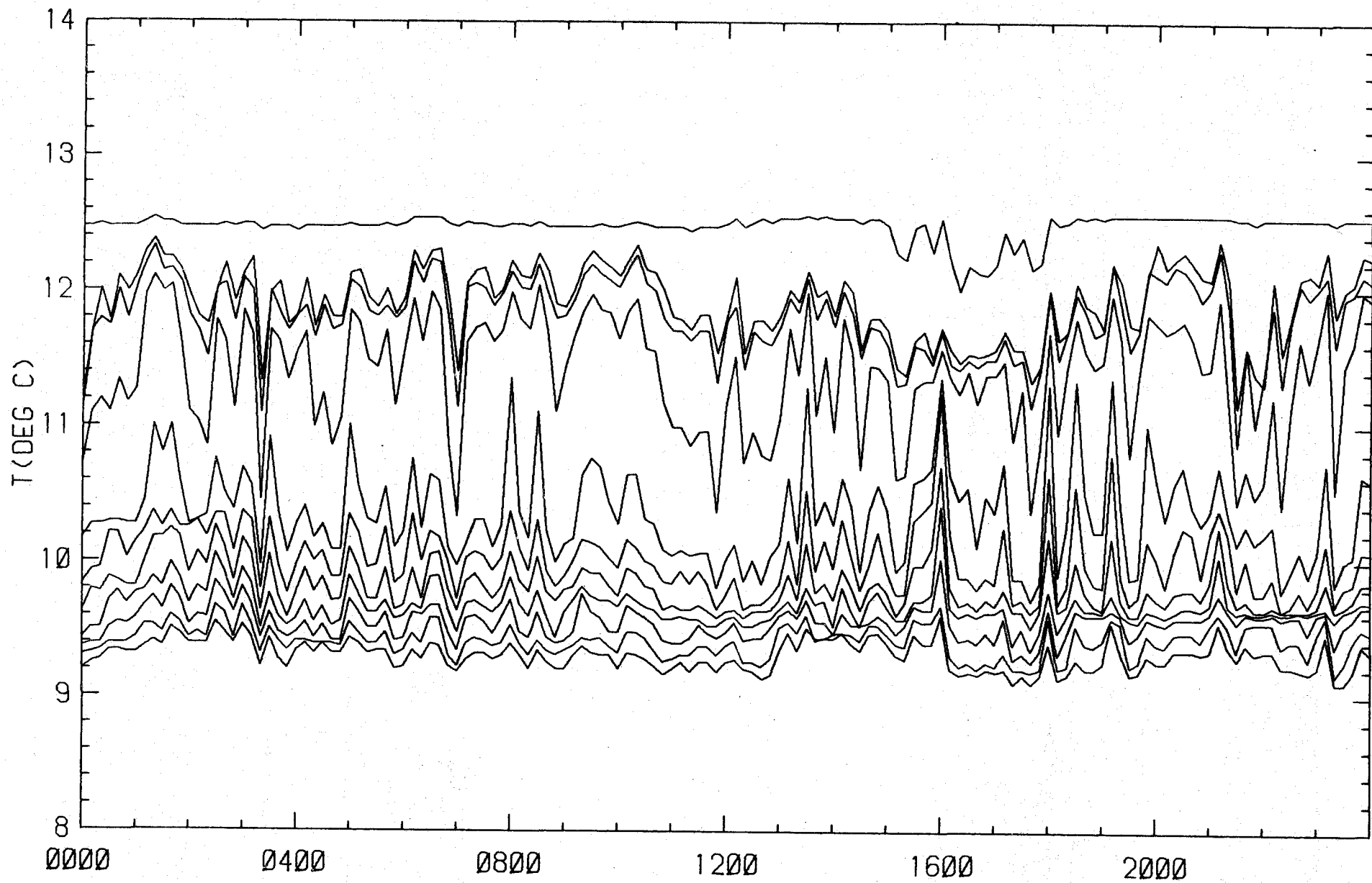




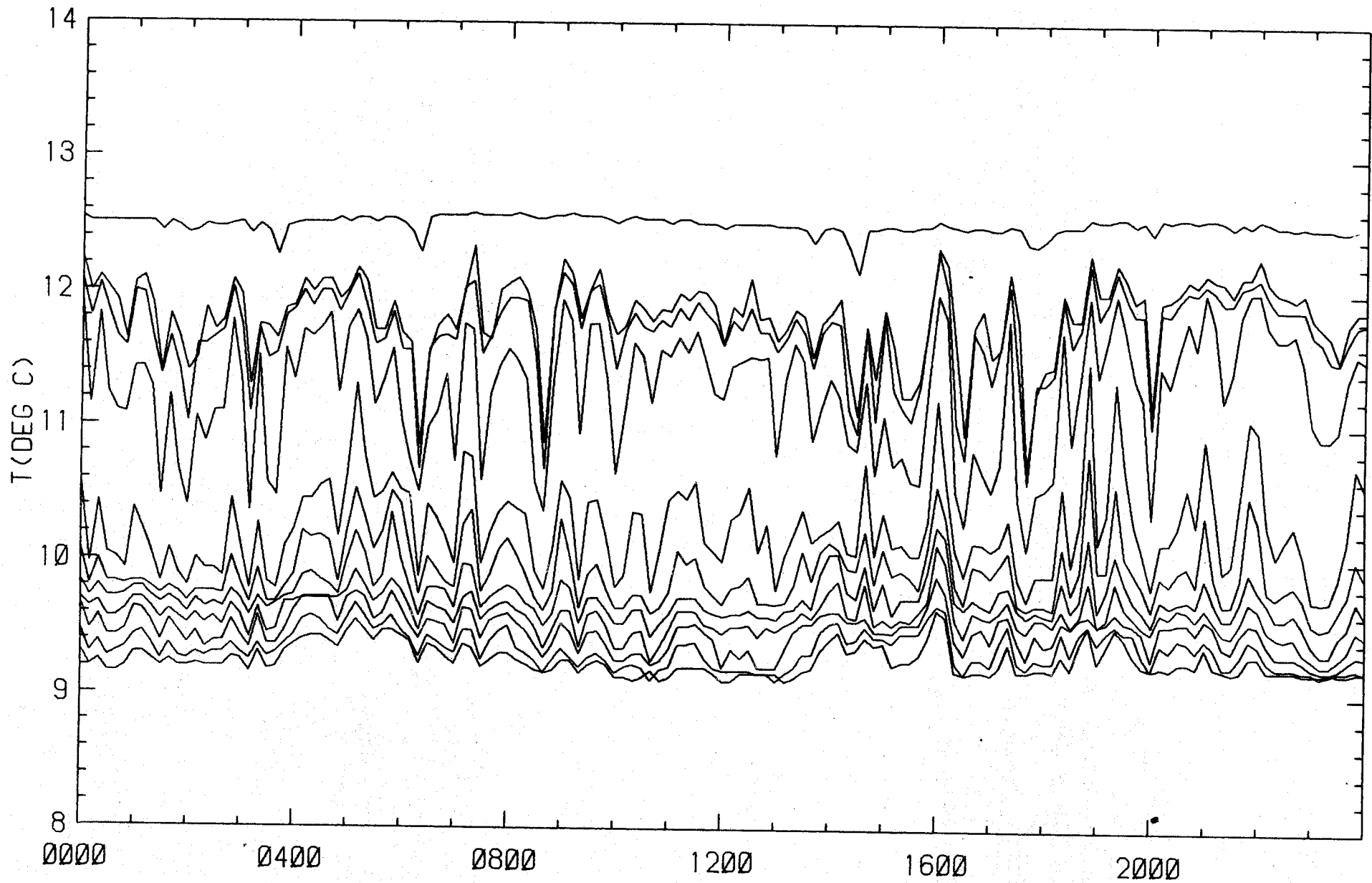
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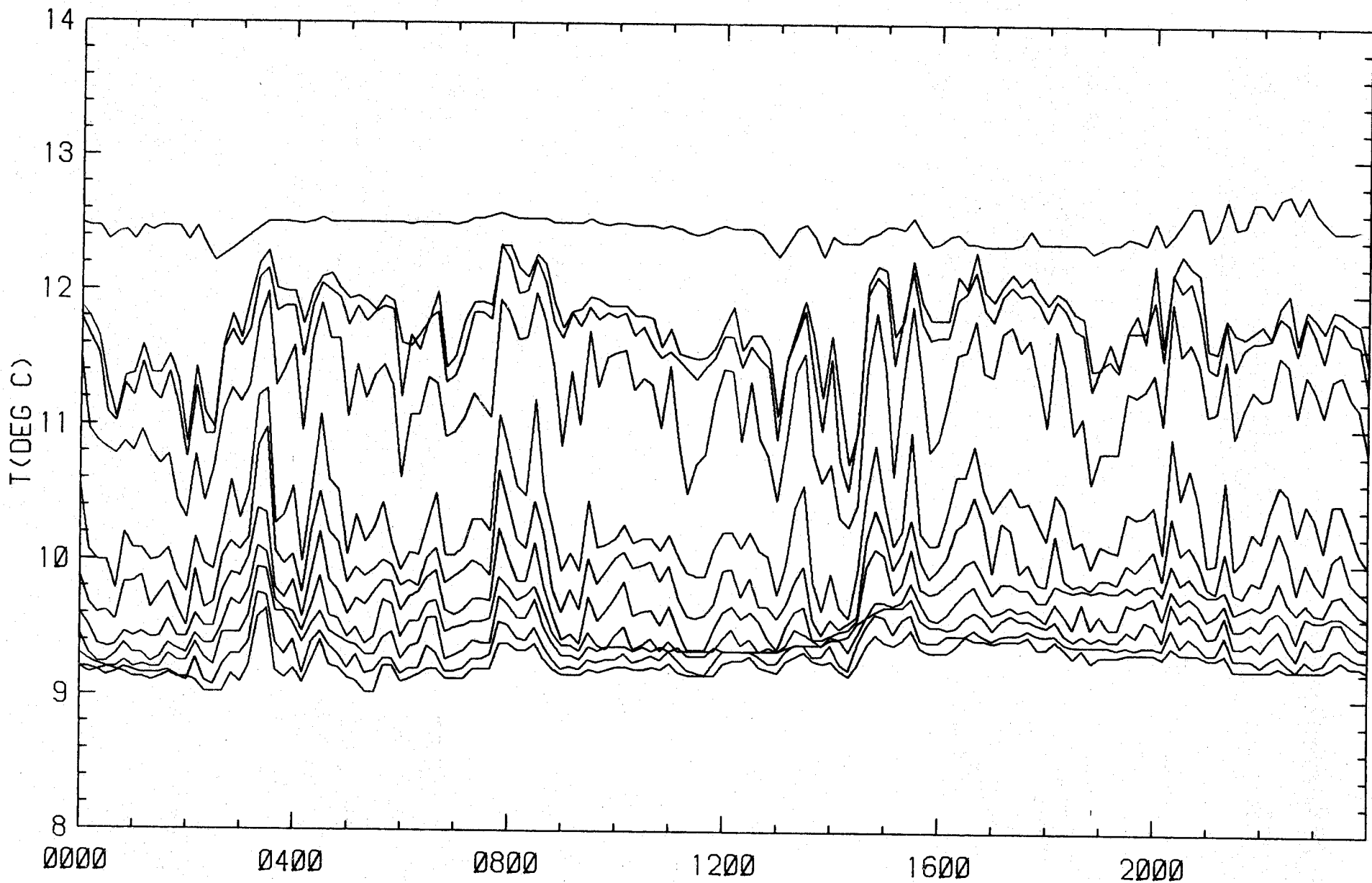
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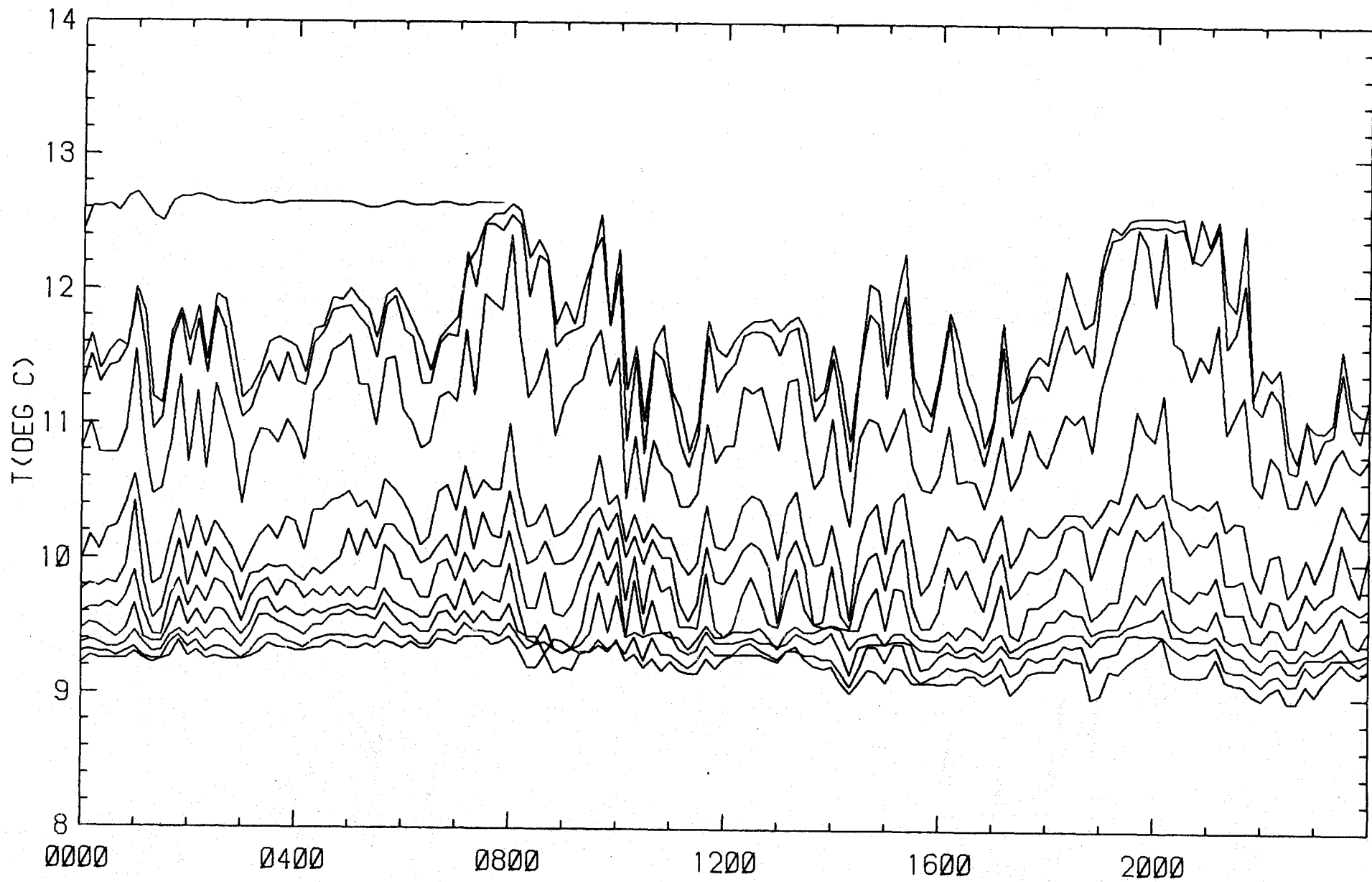
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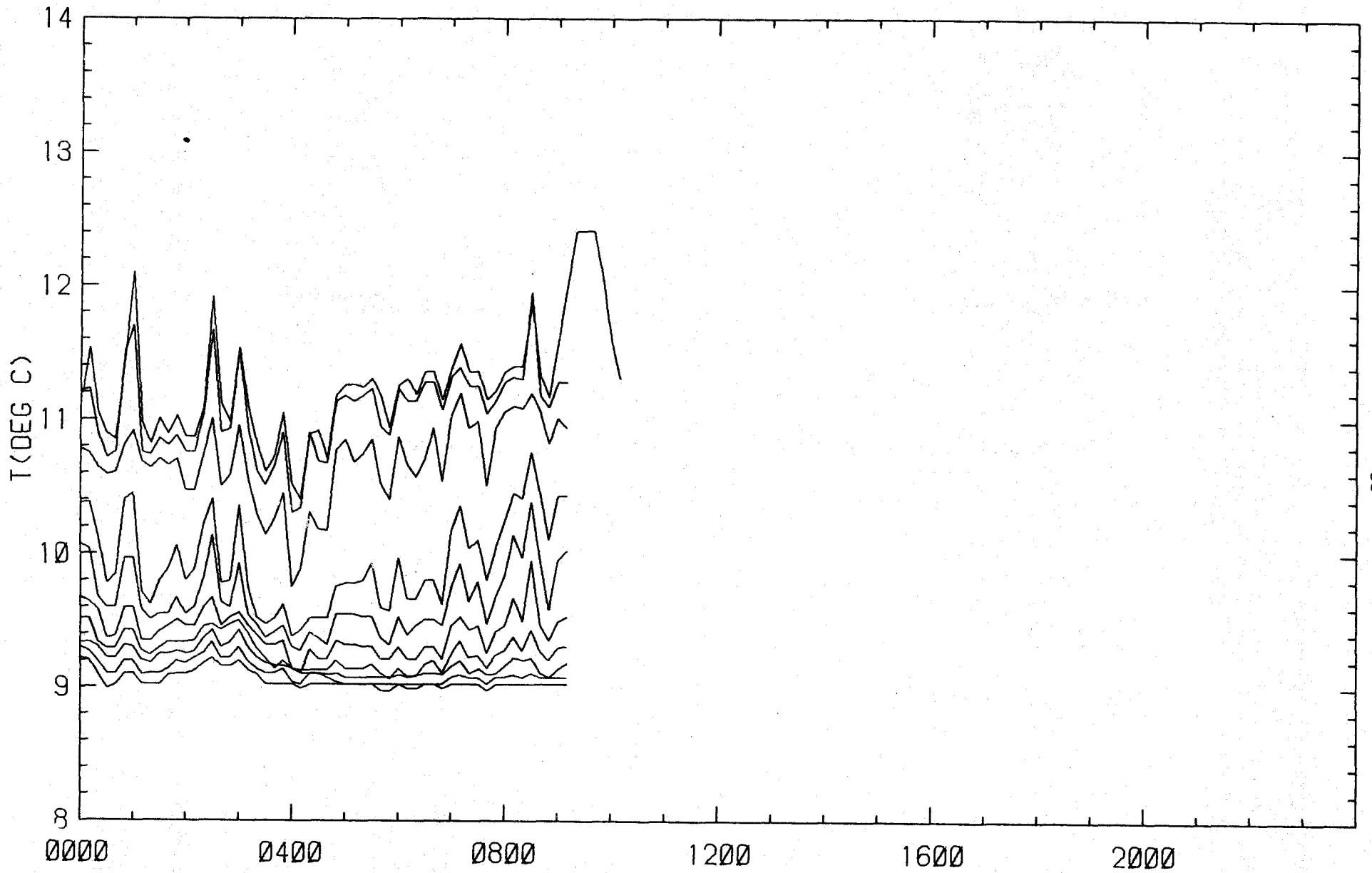
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MOORING B2 TEMP VS TIME 4 SEP 78



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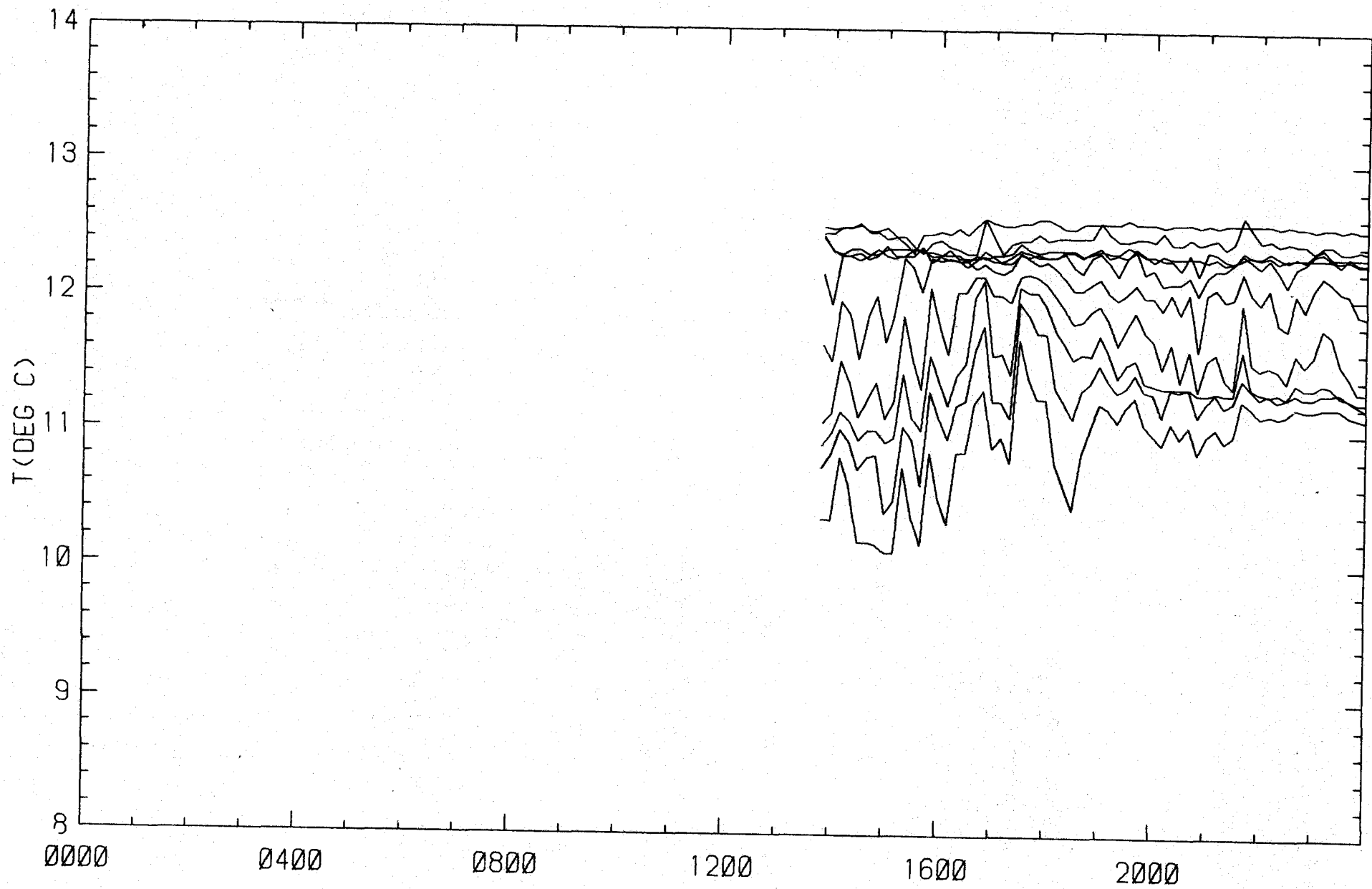


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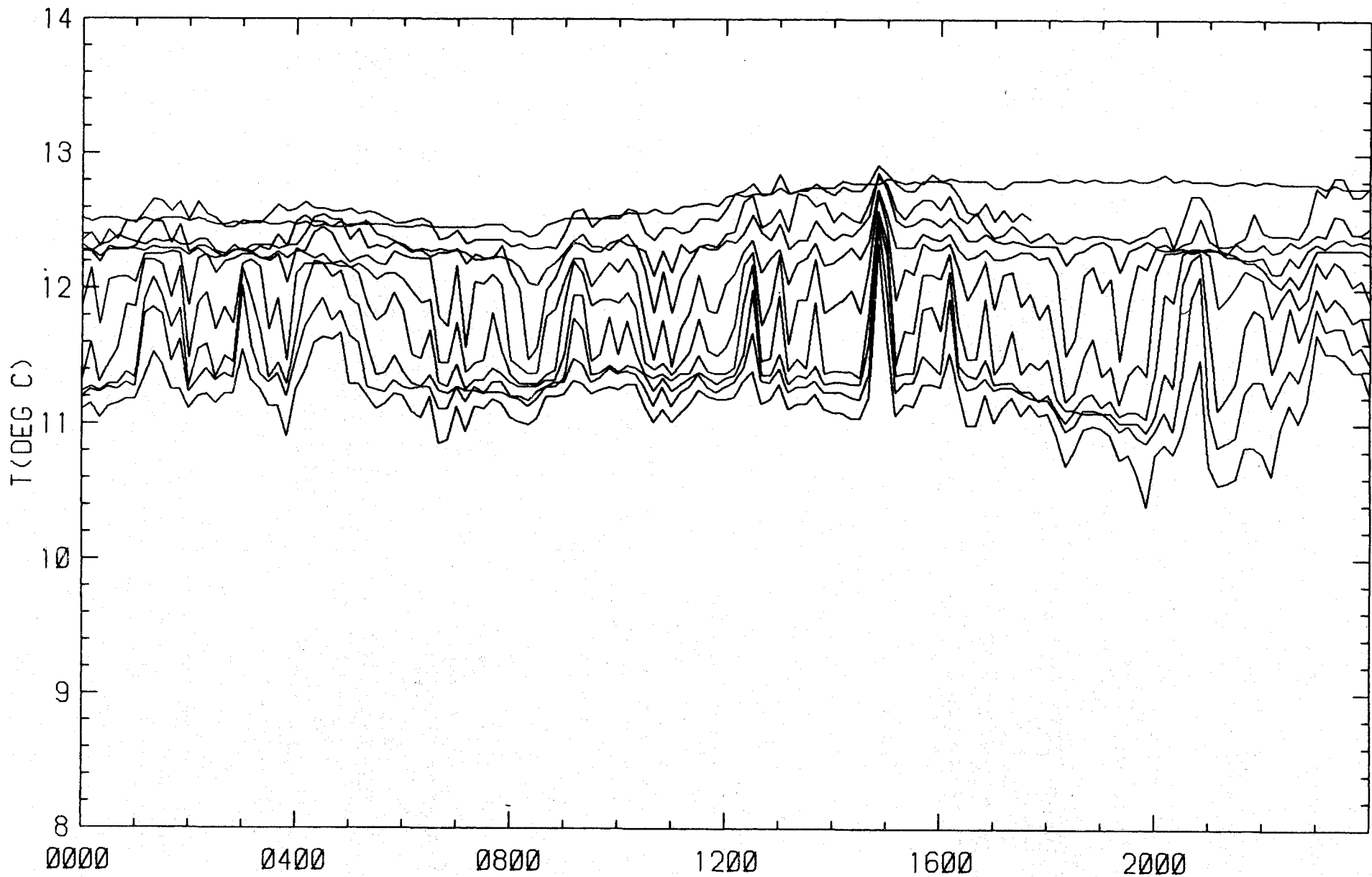
APPENDIX E

Temperature Observations at B4

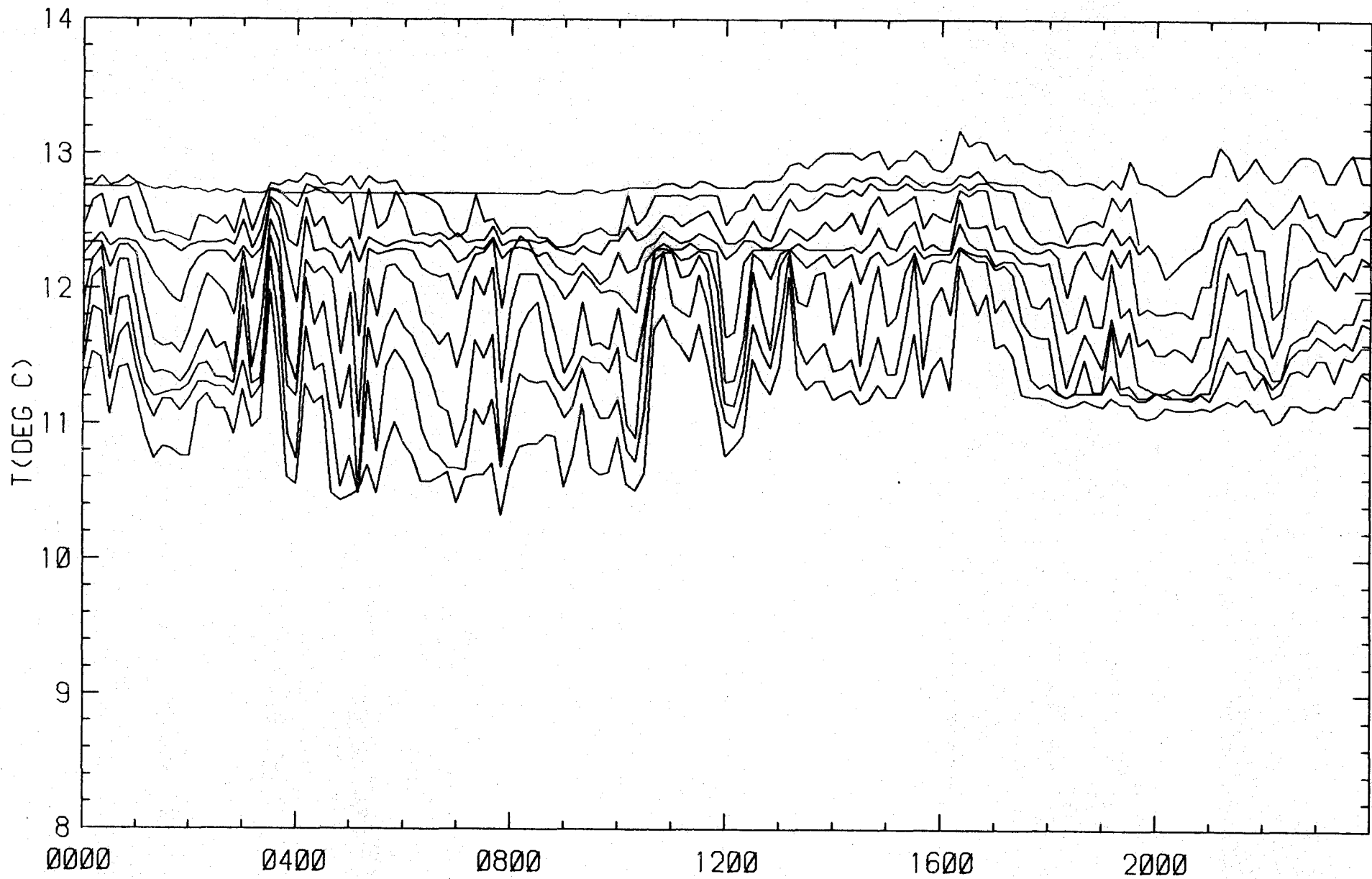




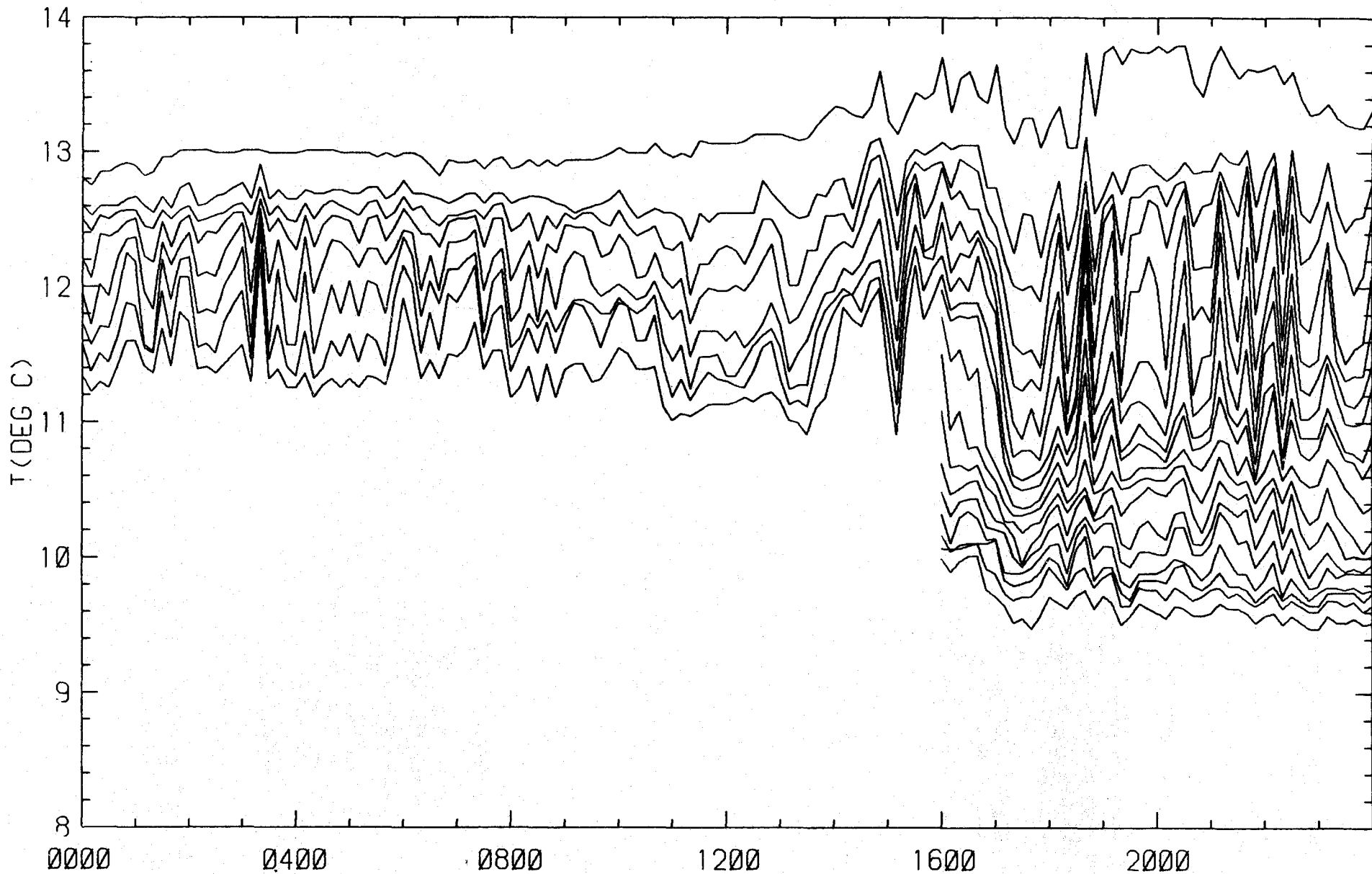
MOORING B4 TEMP VS TIME 28 JUL 78



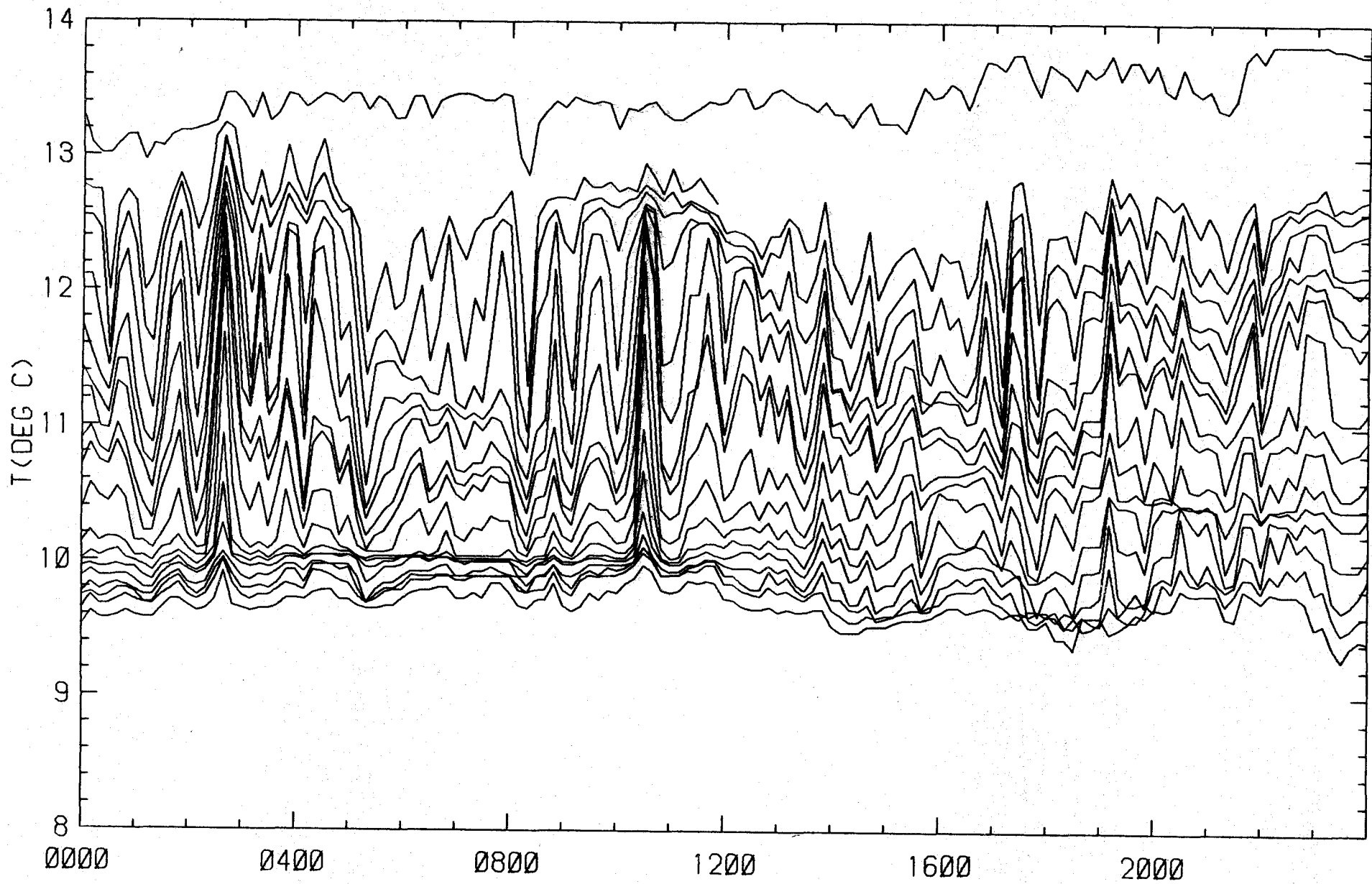
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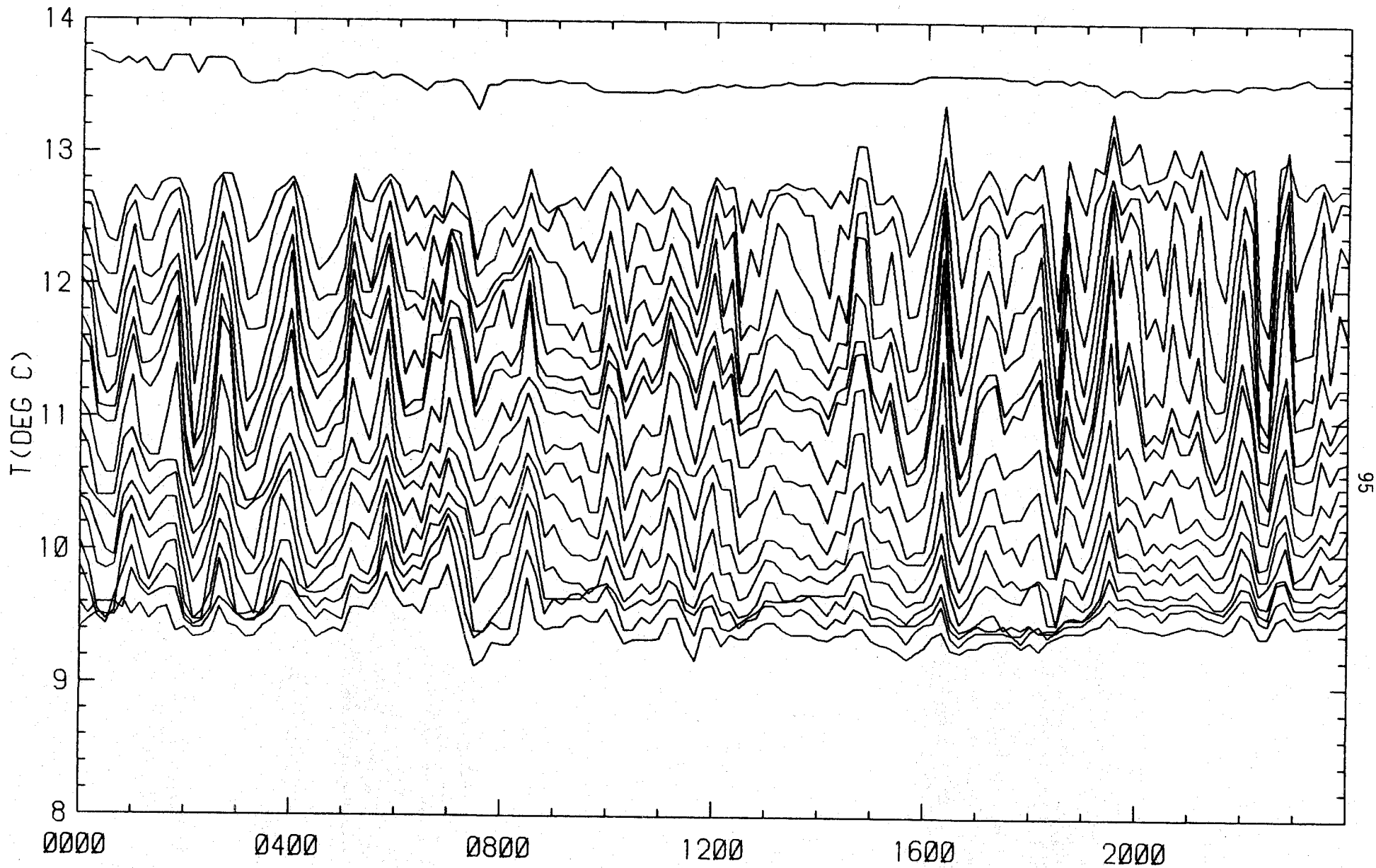
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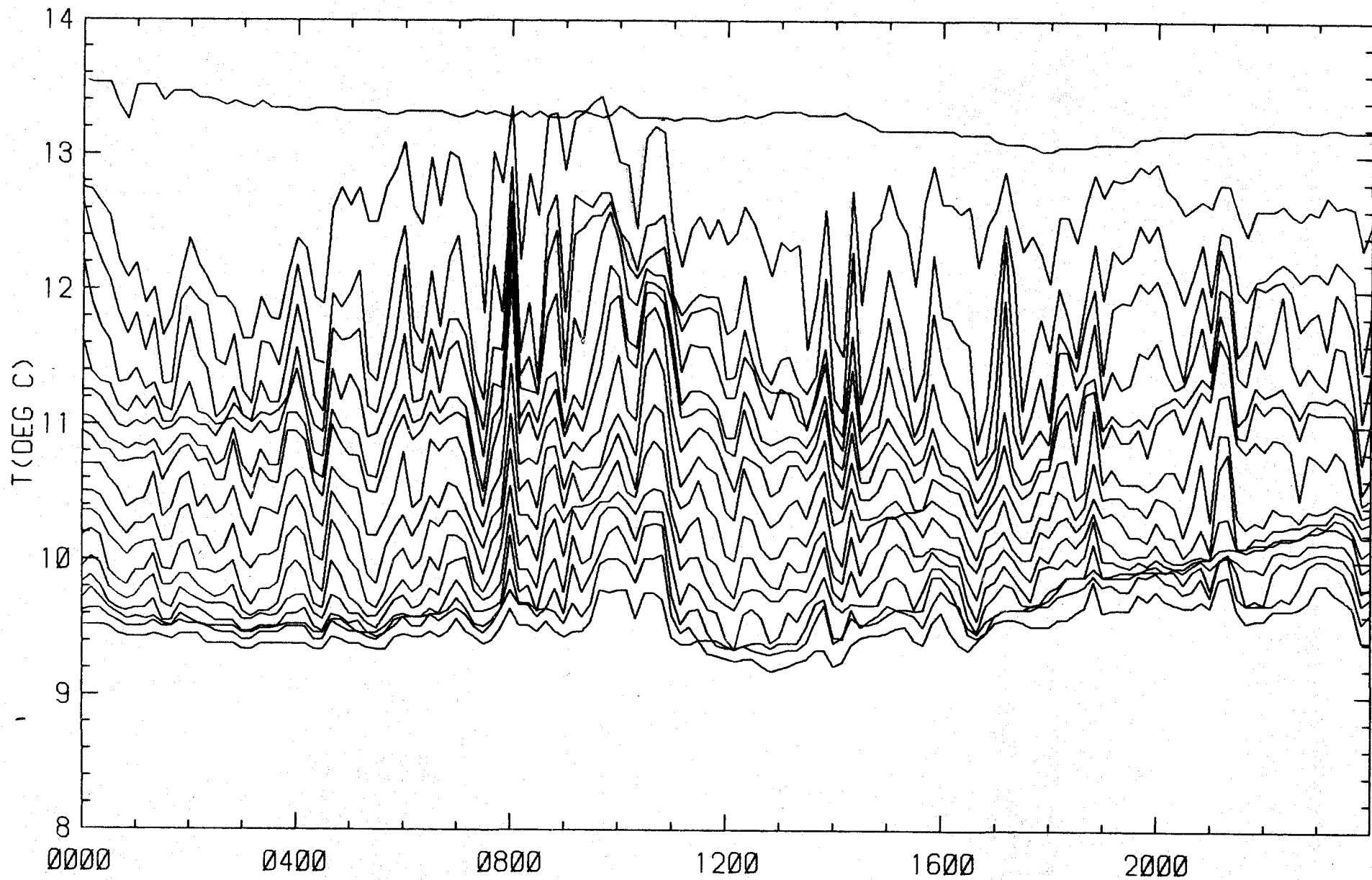
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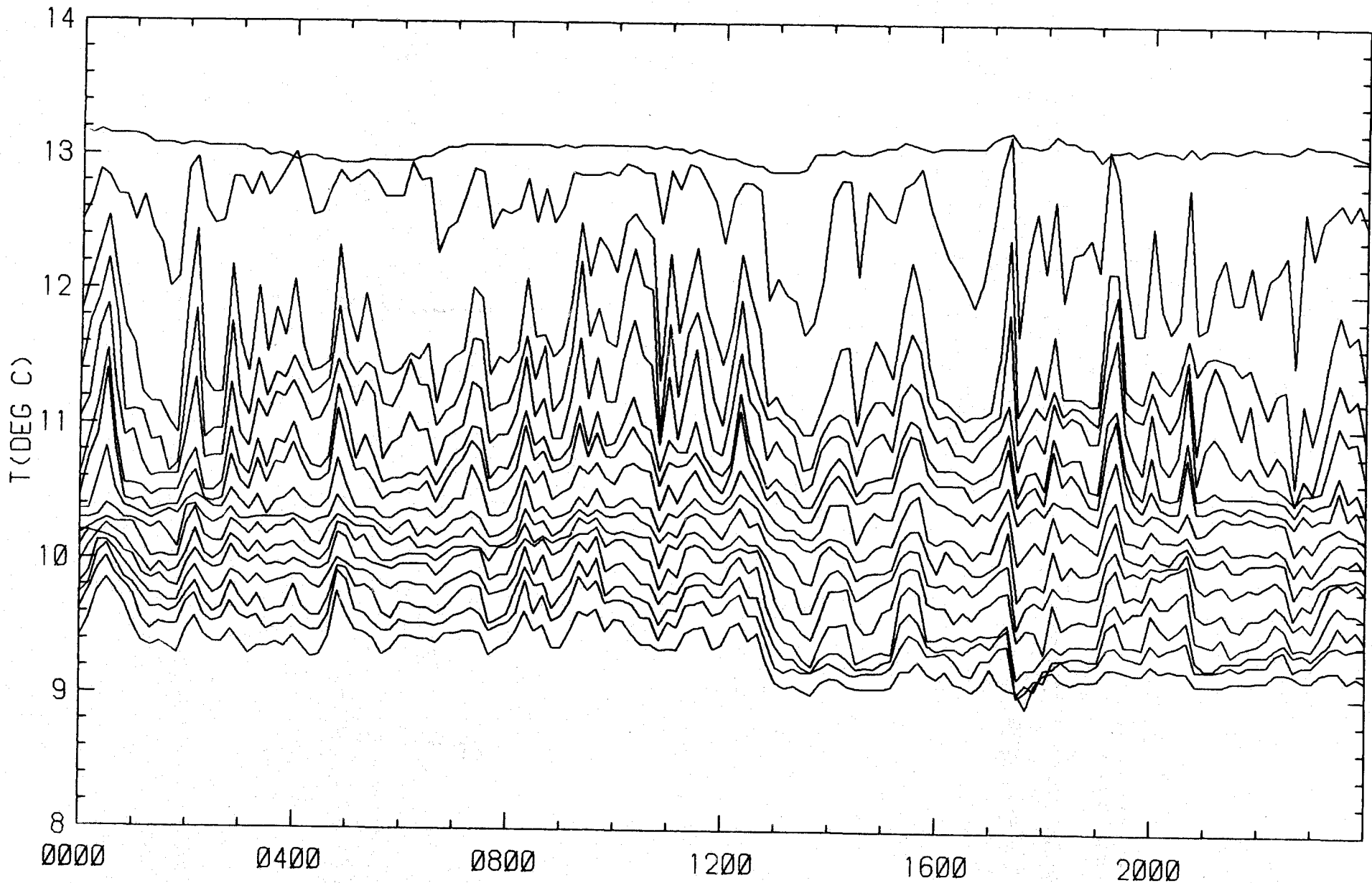
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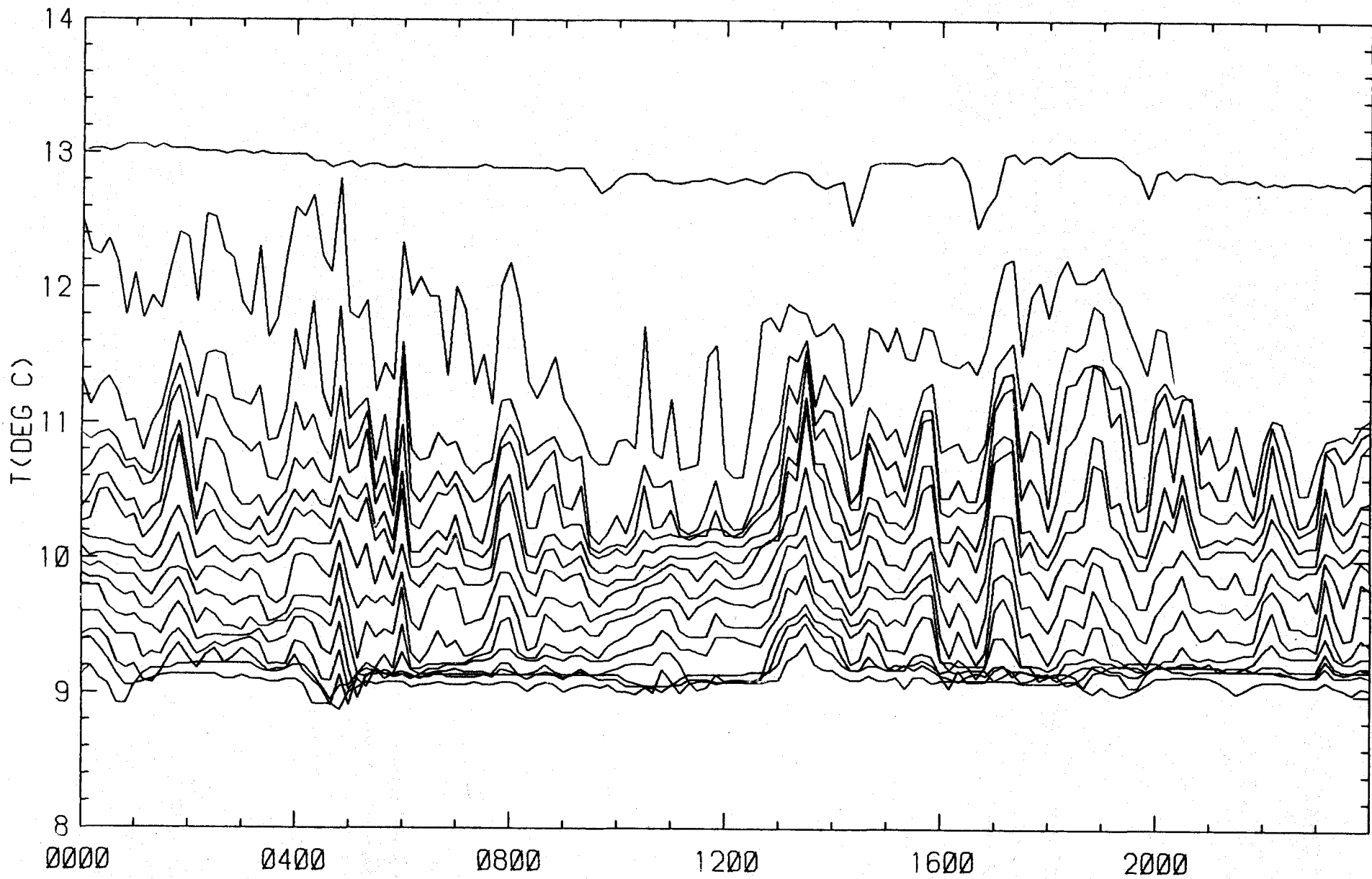


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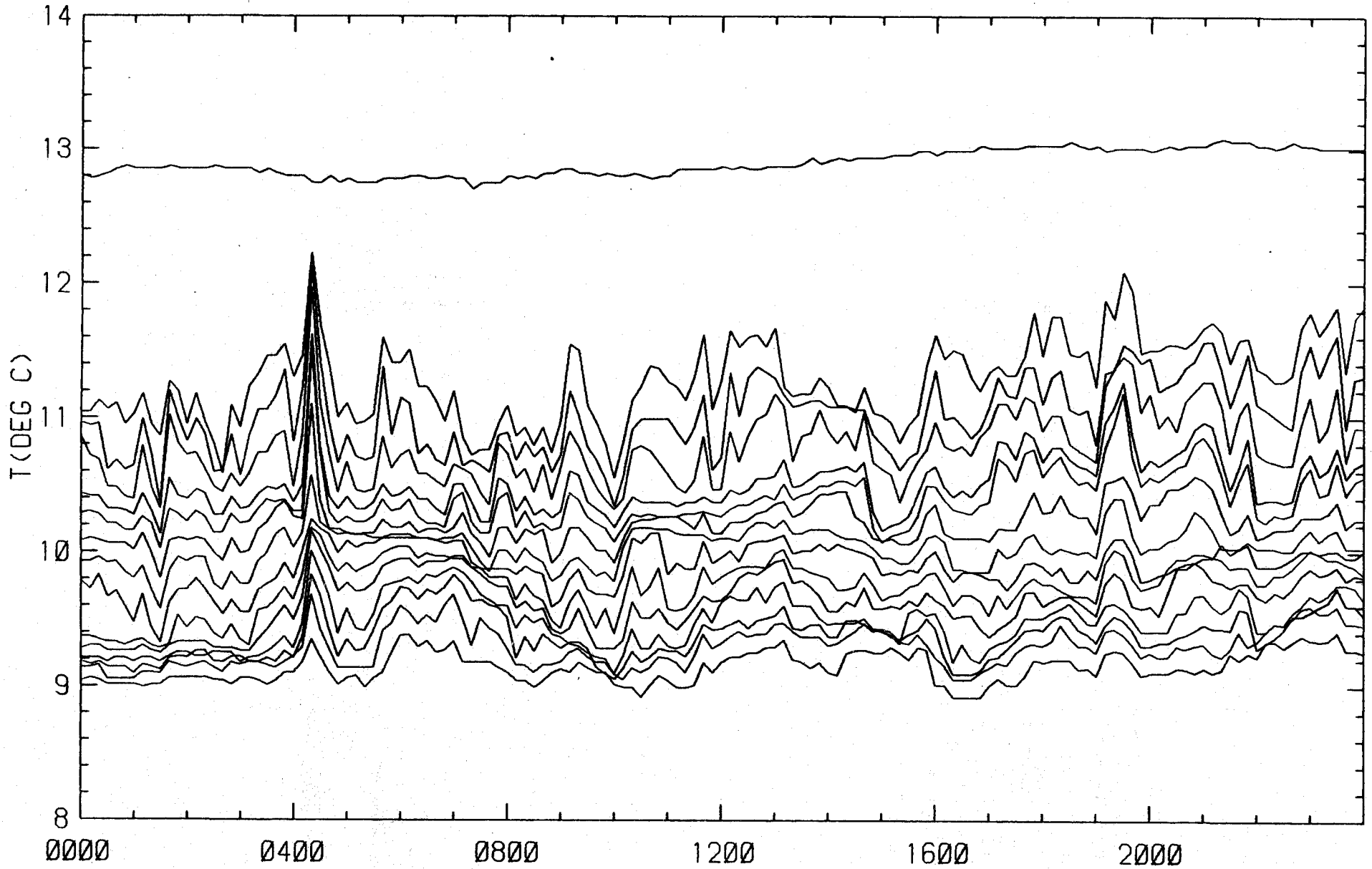


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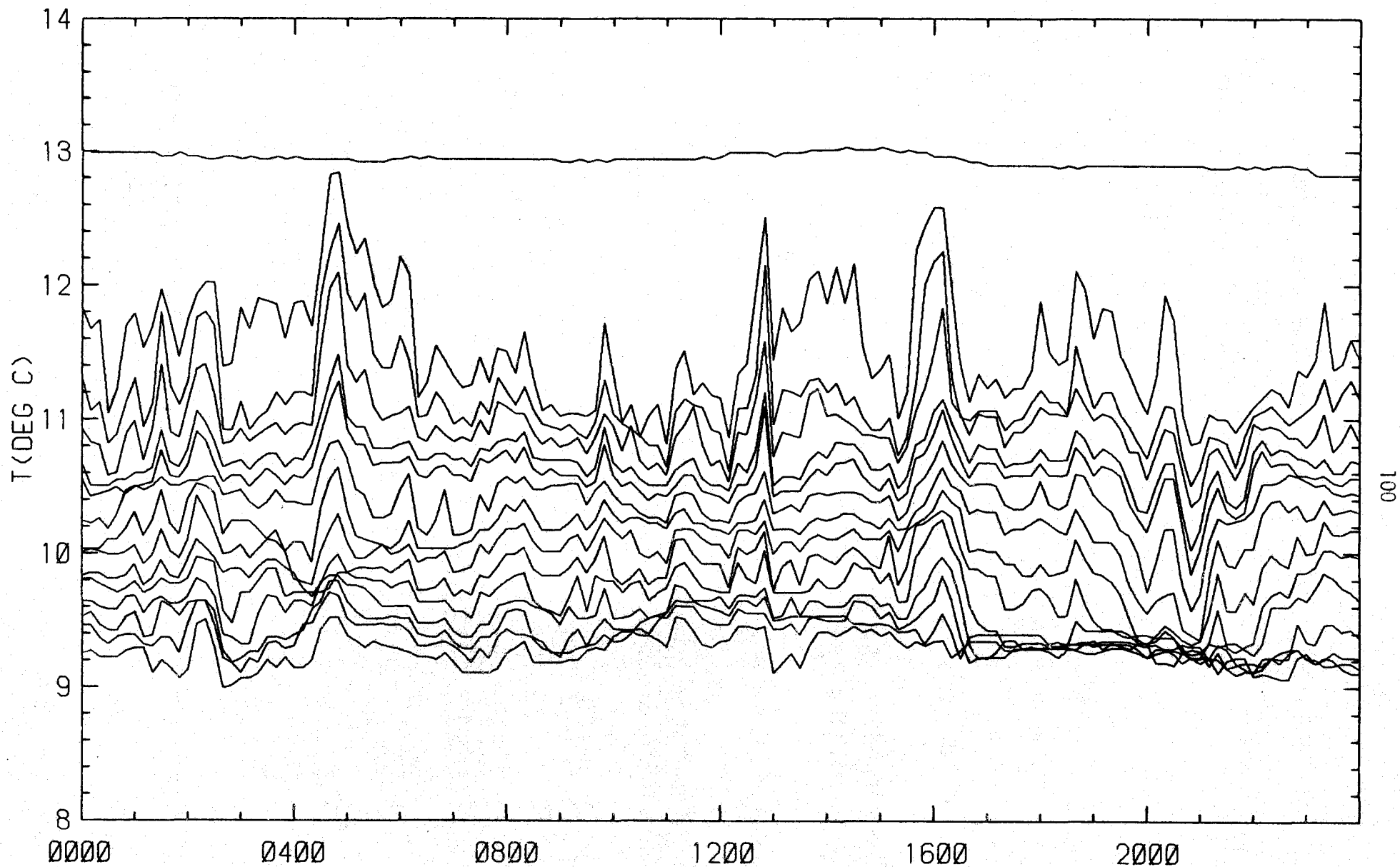




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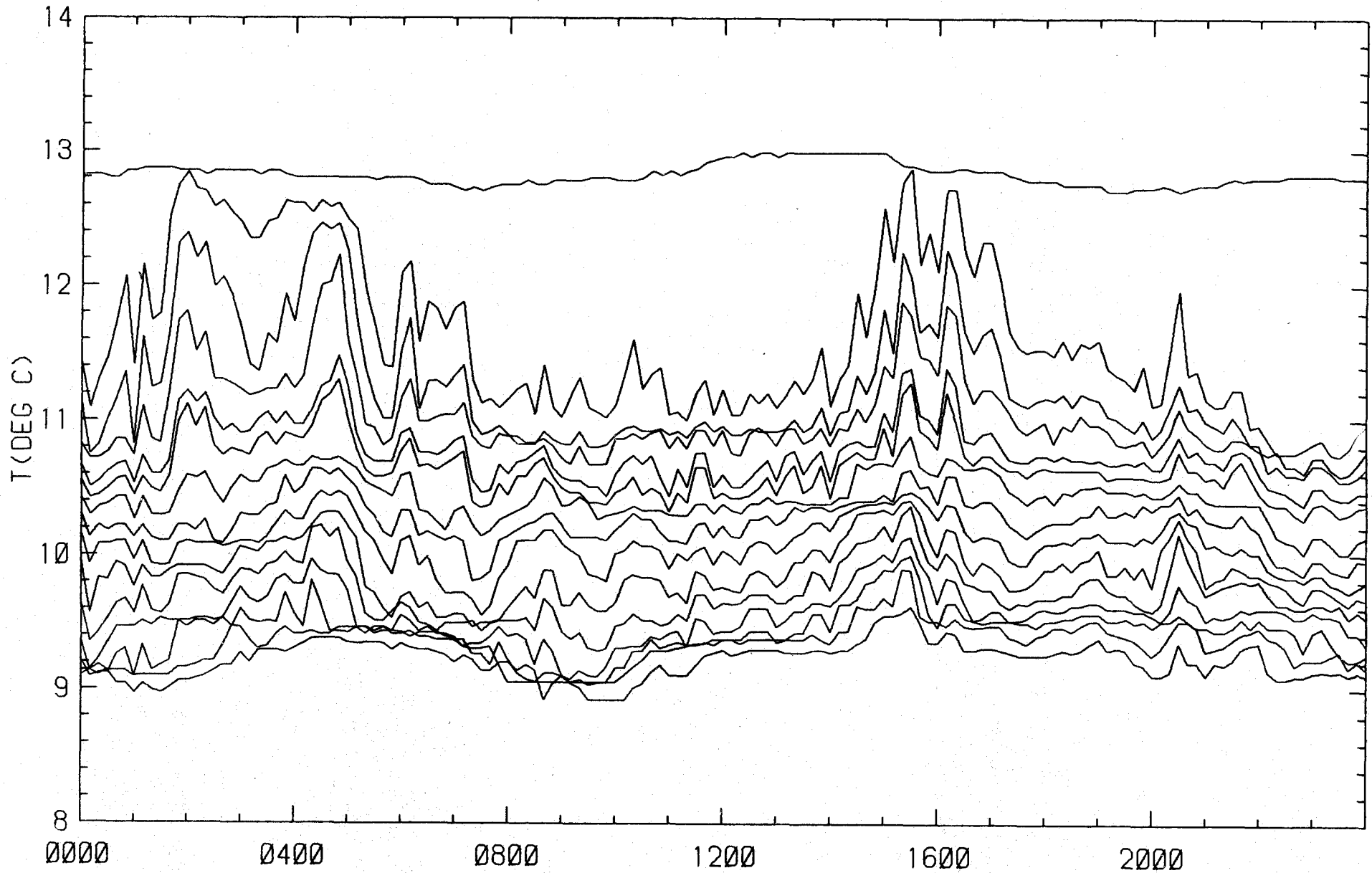


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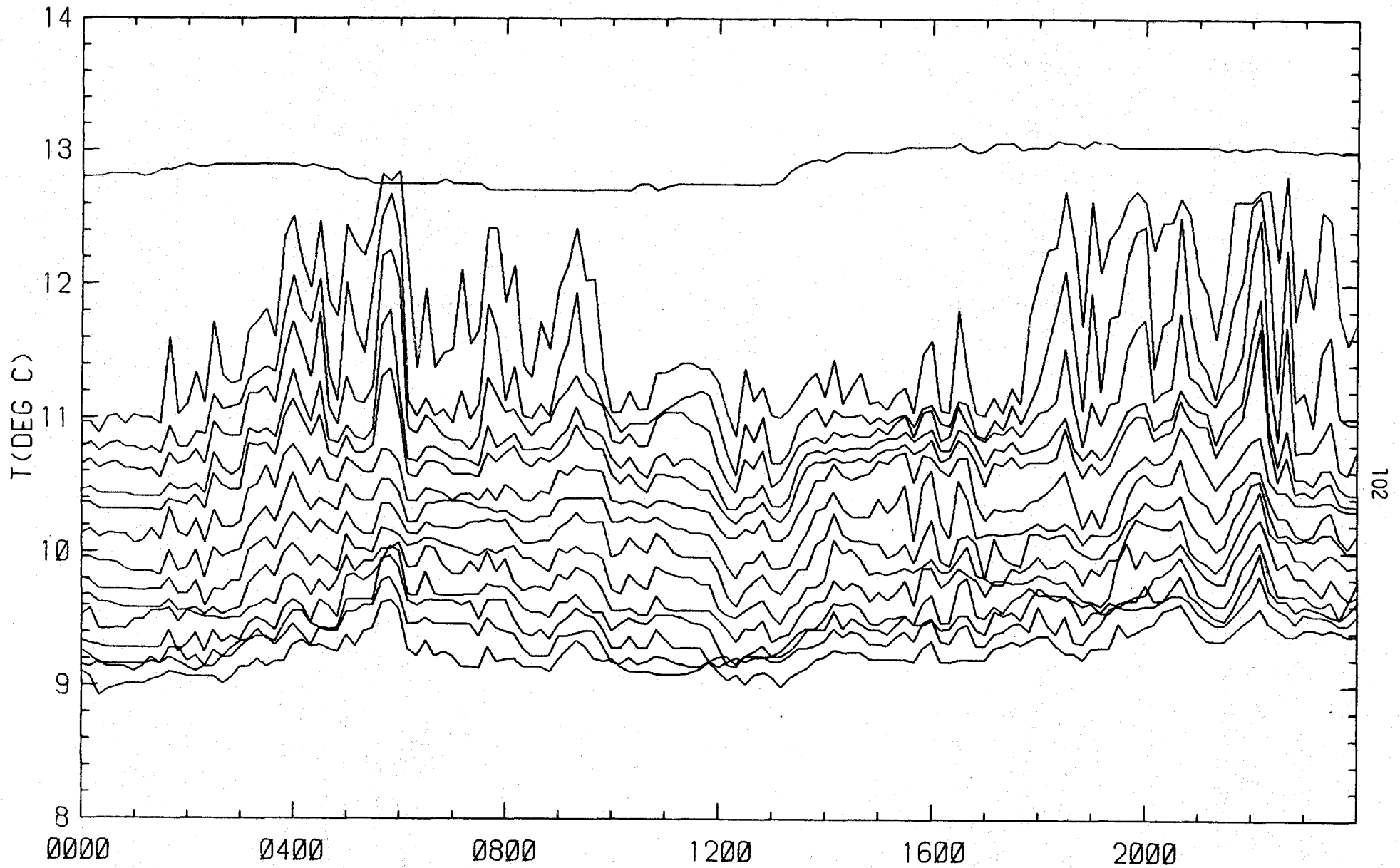


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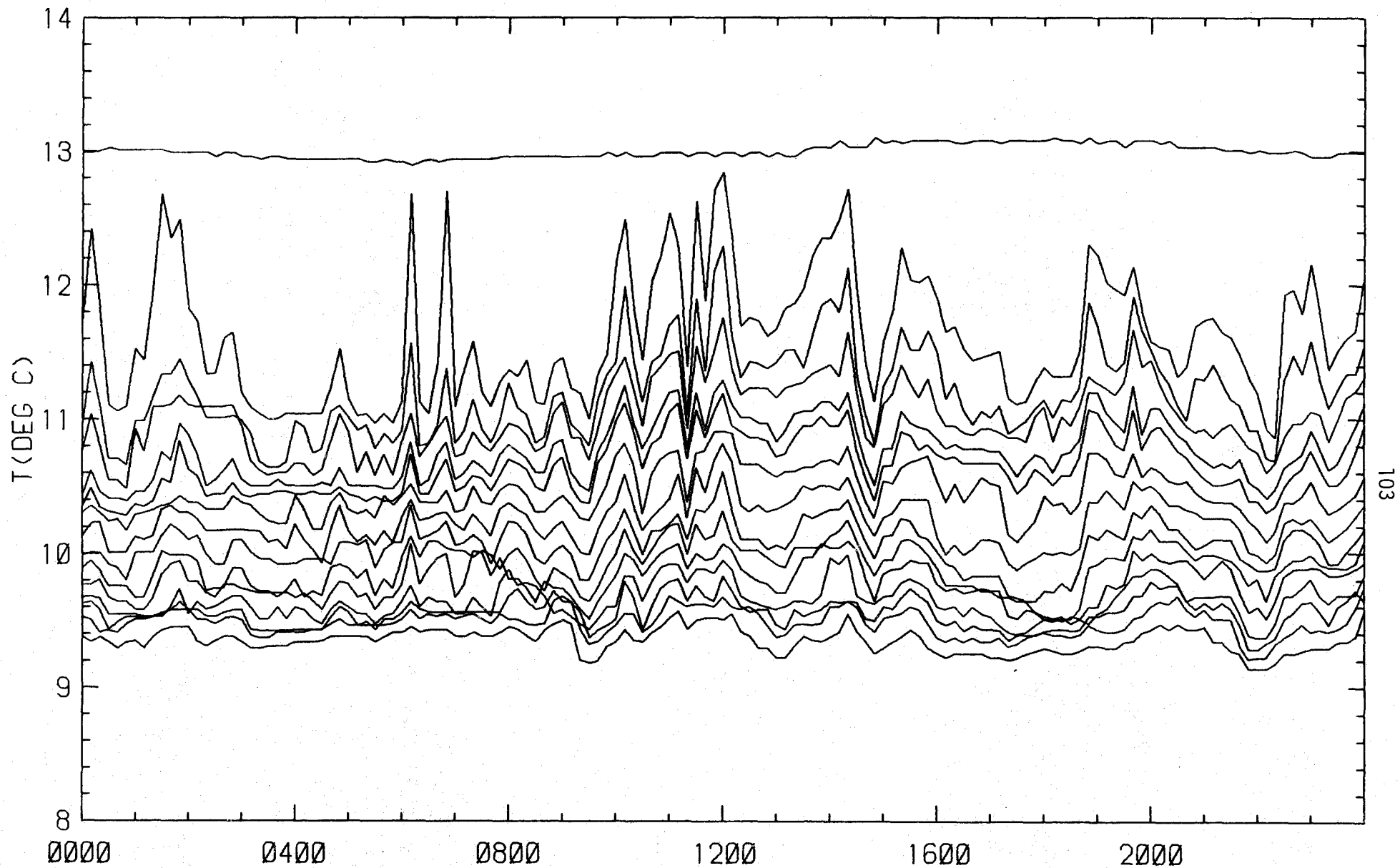


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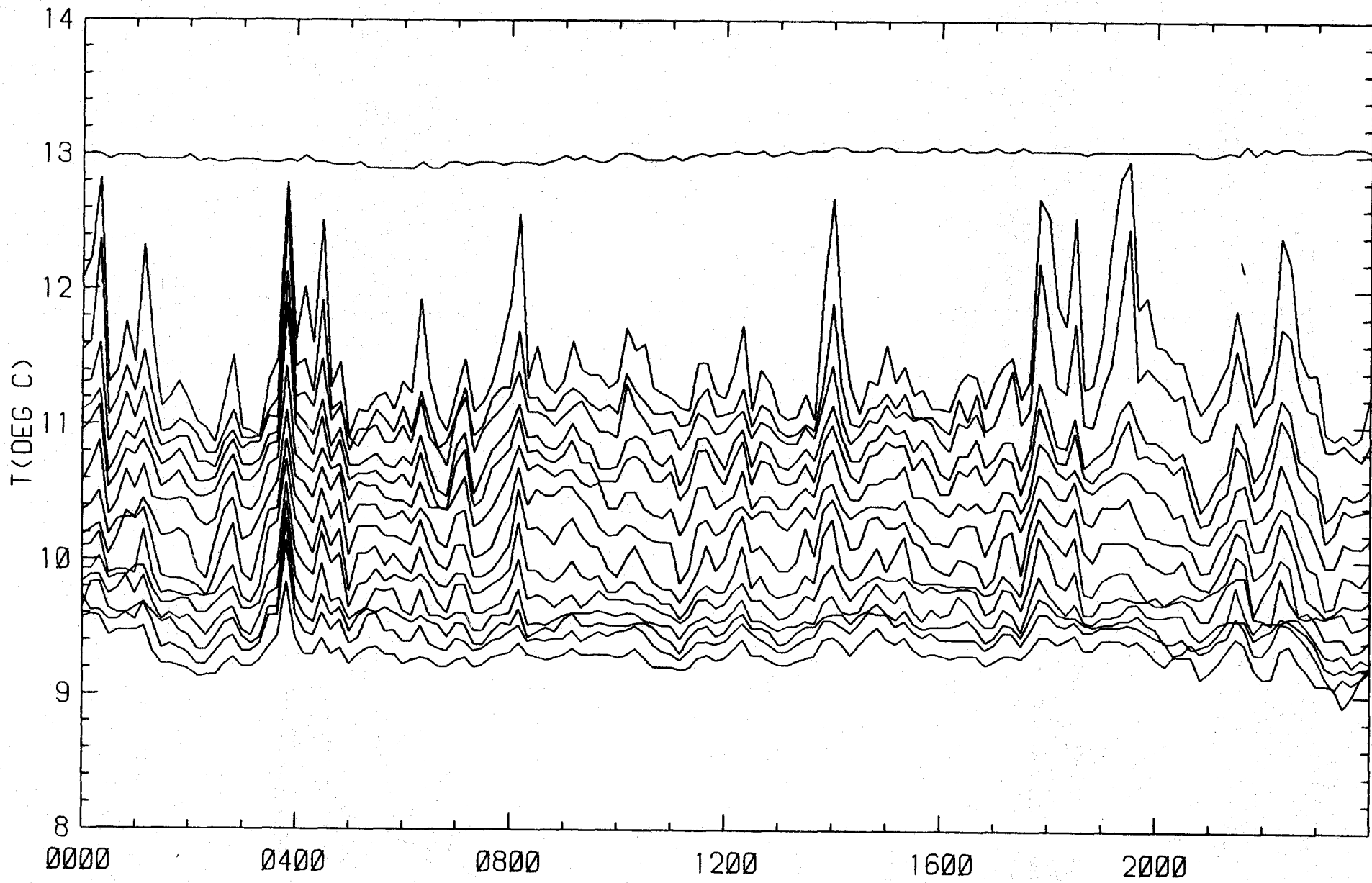


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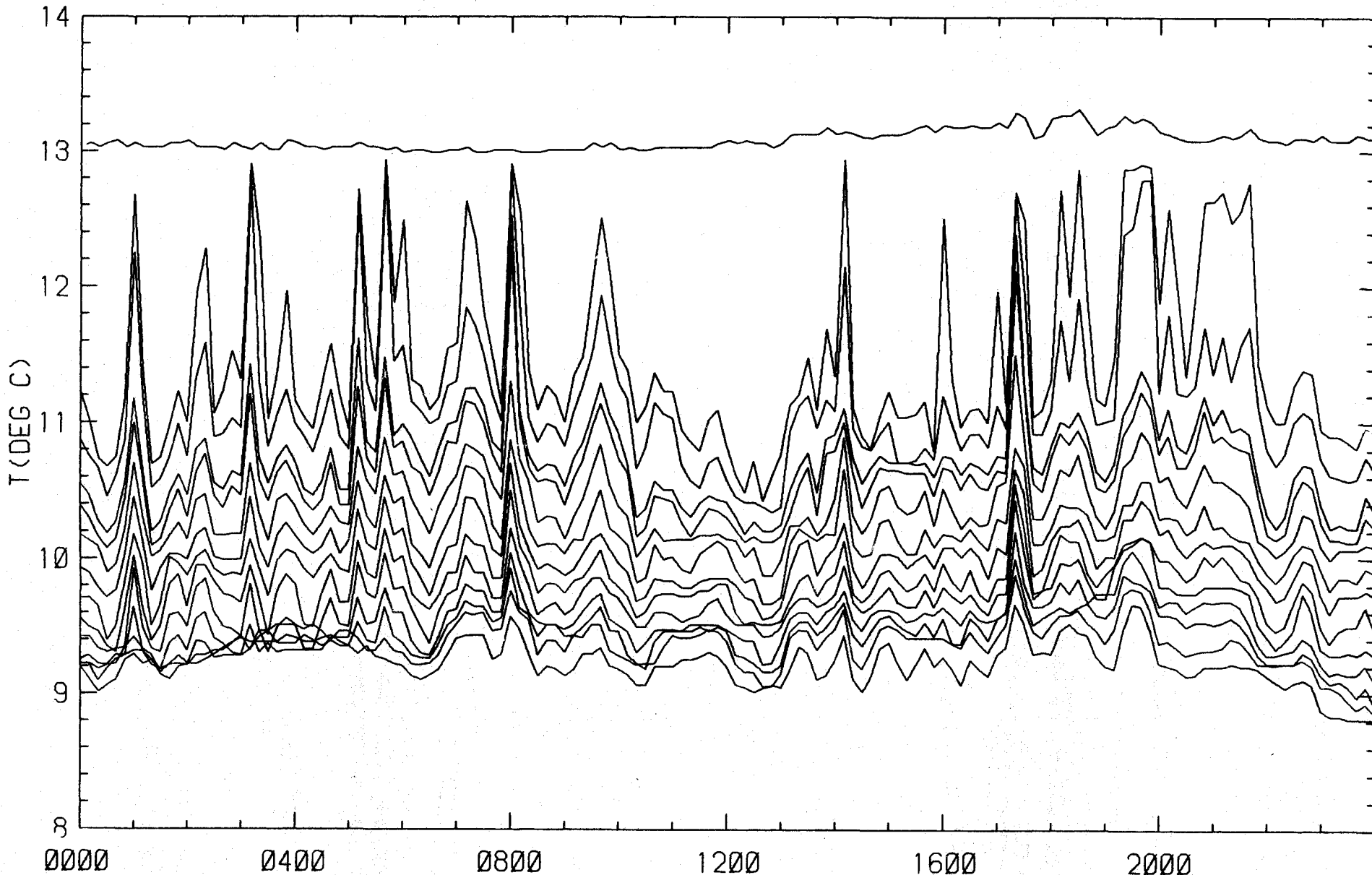
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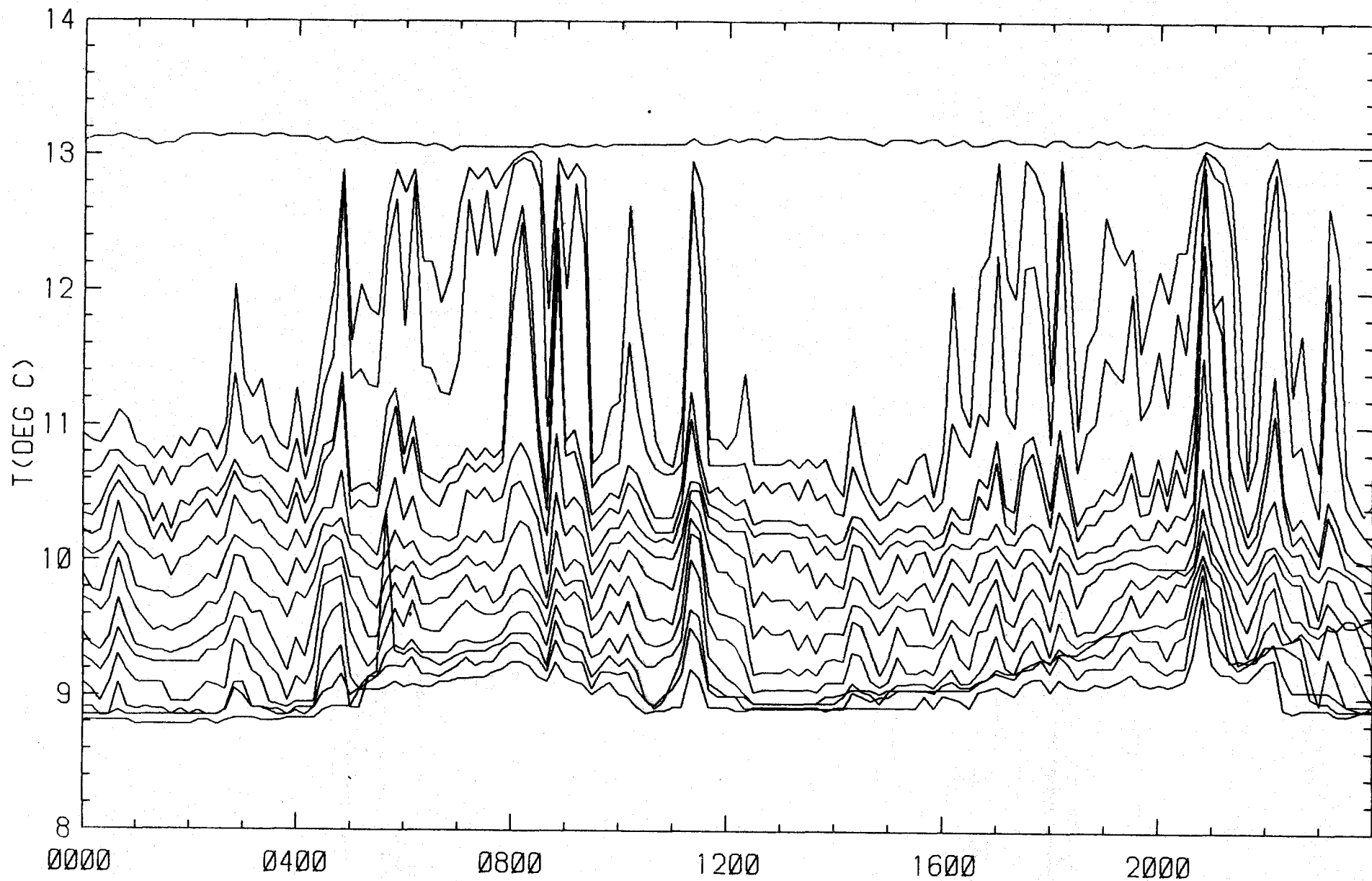


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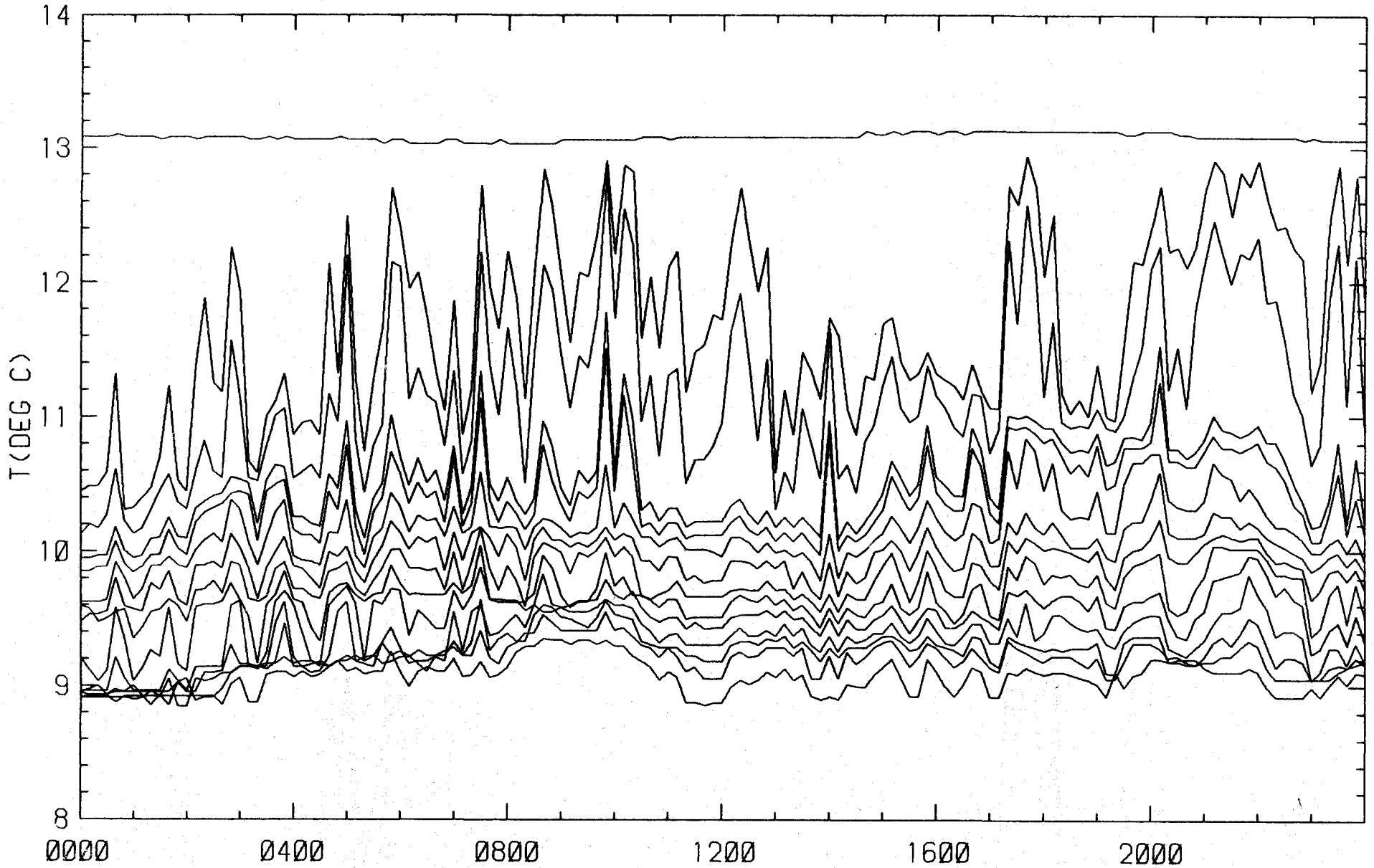


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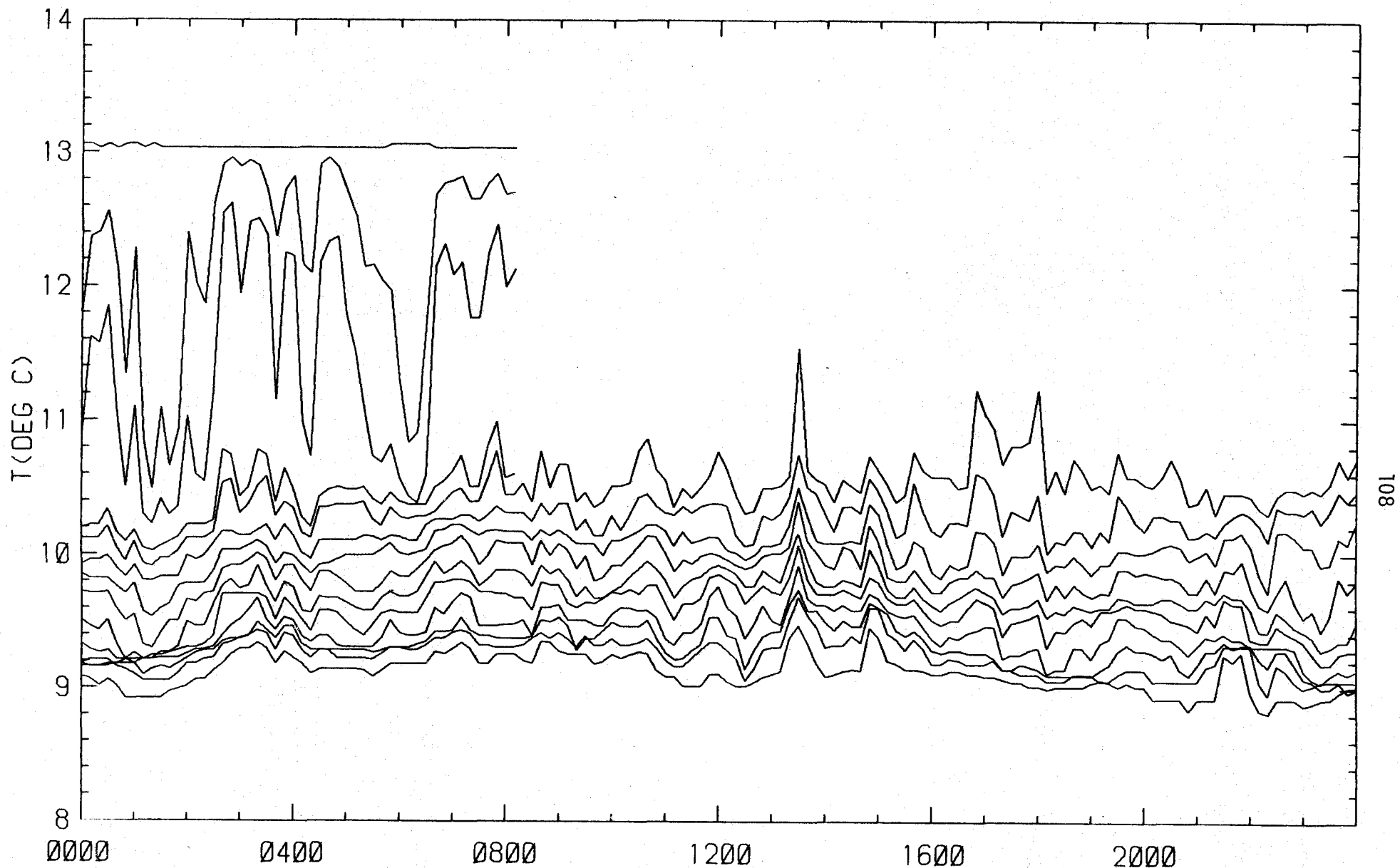




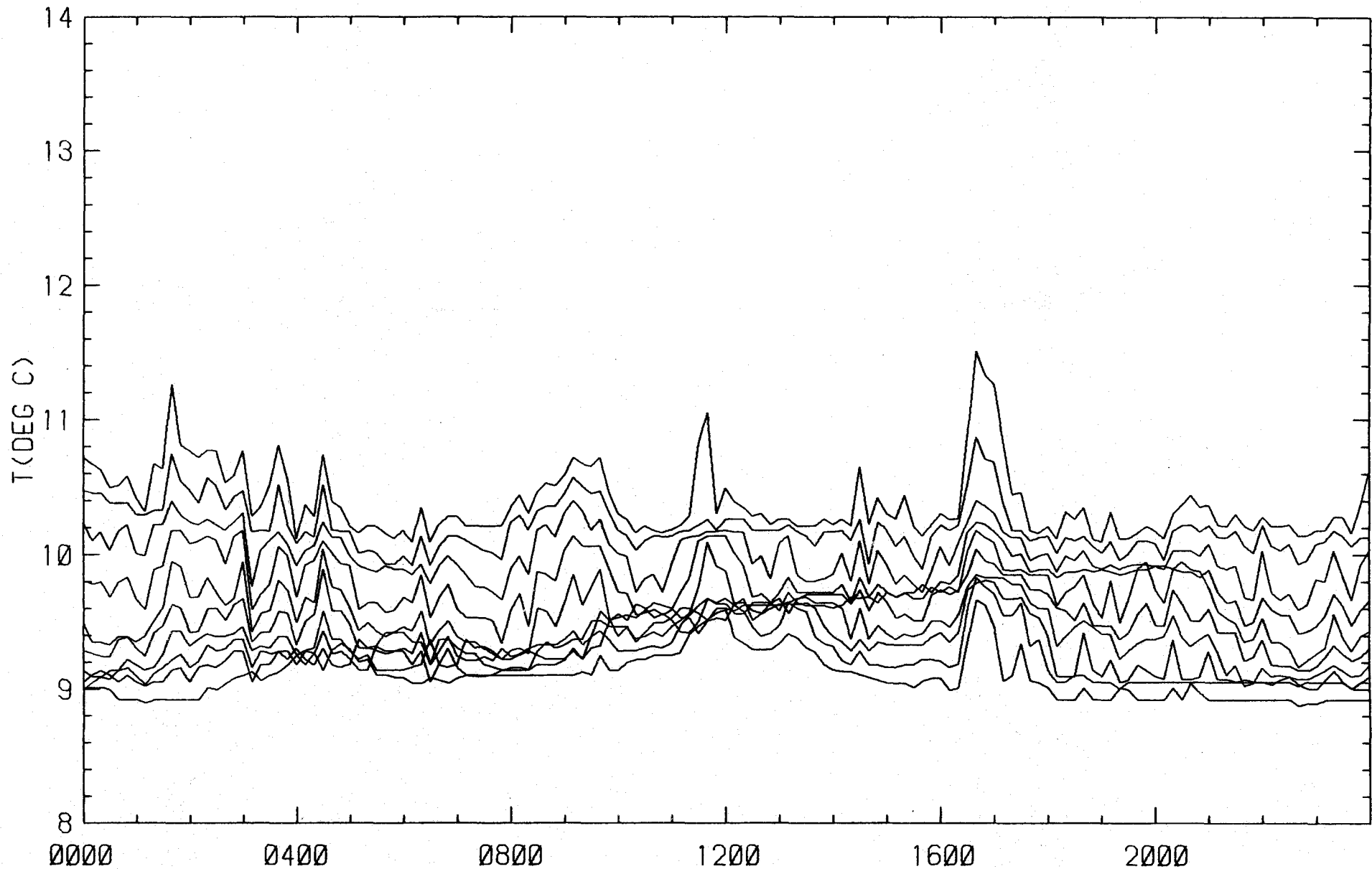
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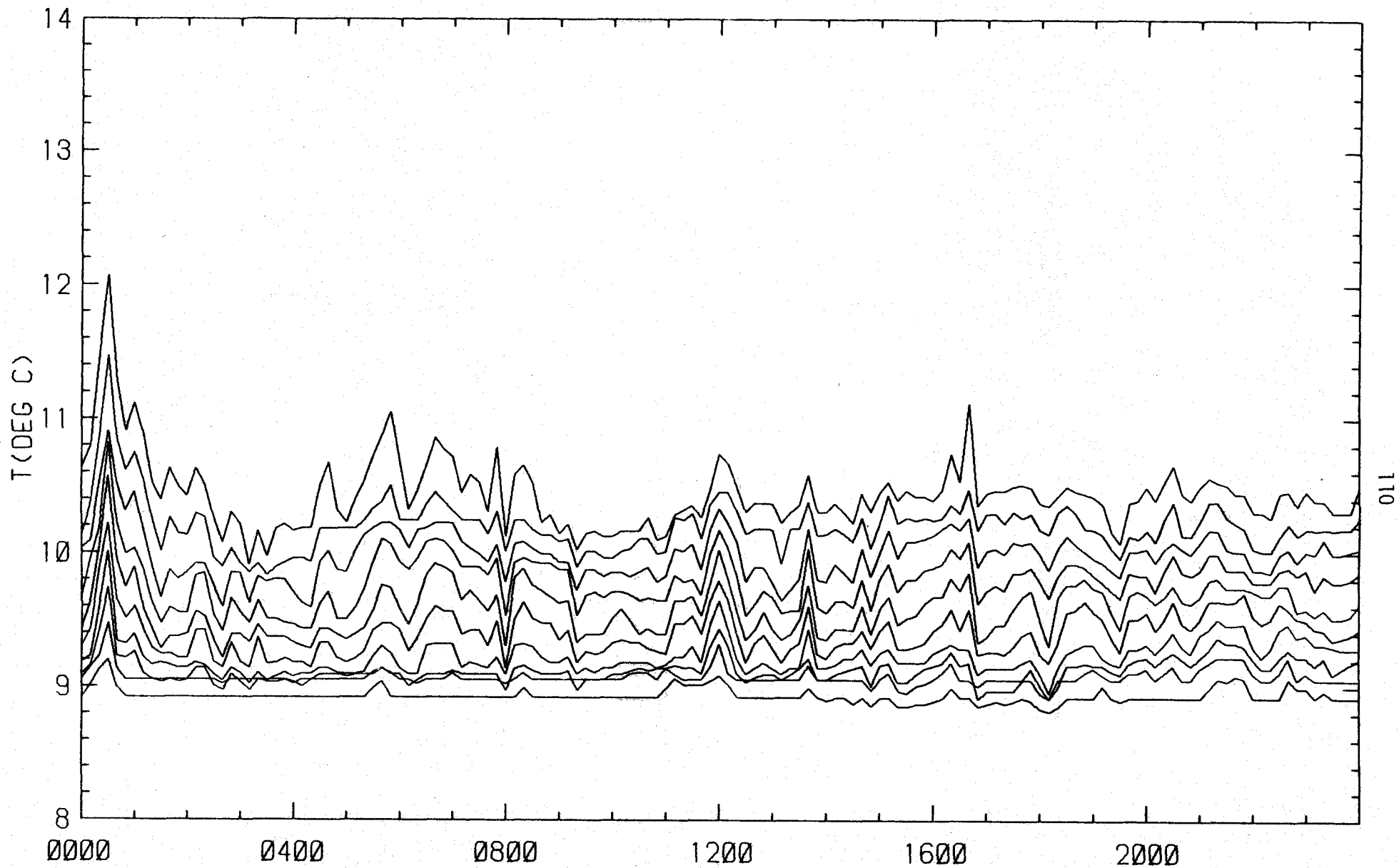
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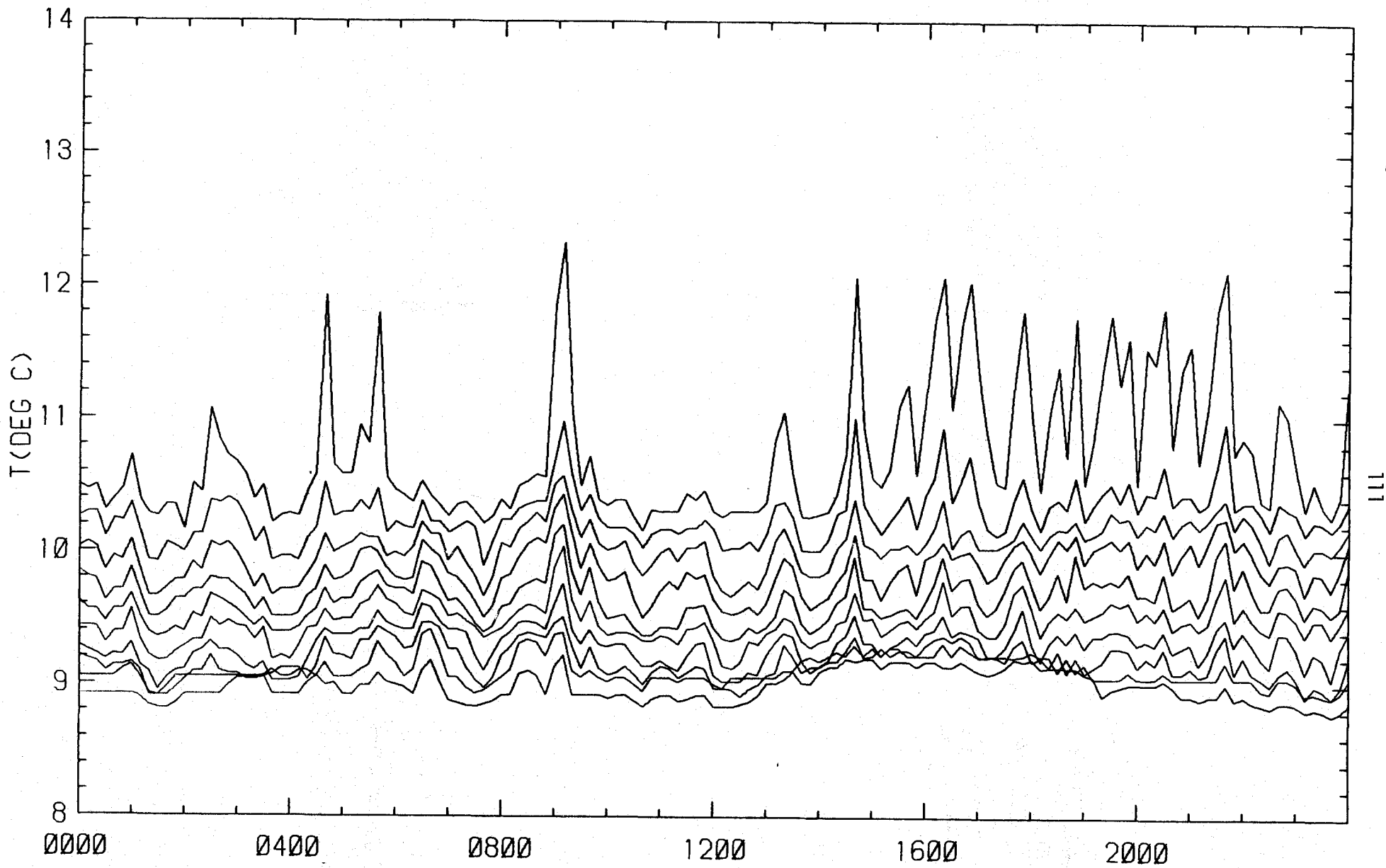


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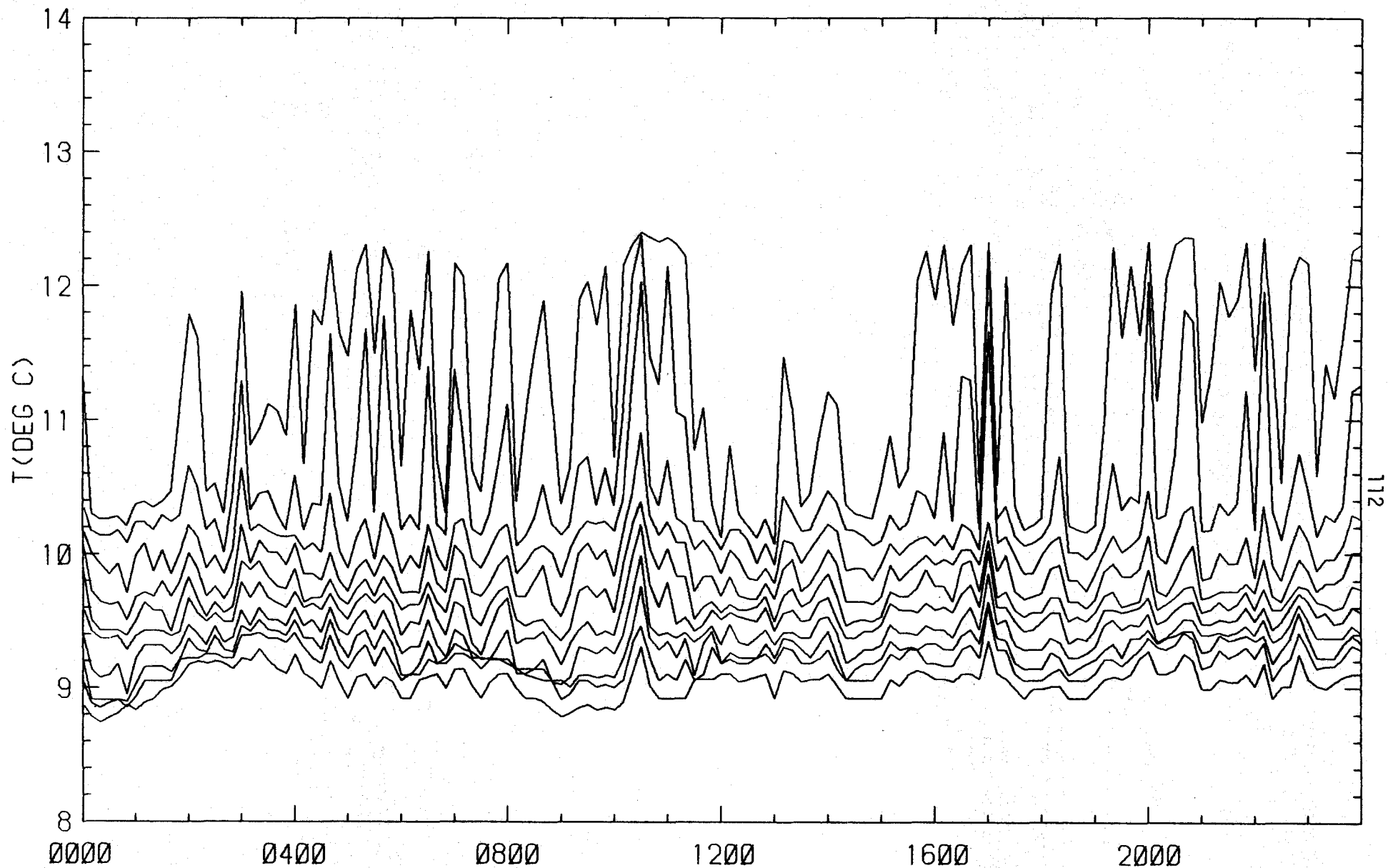
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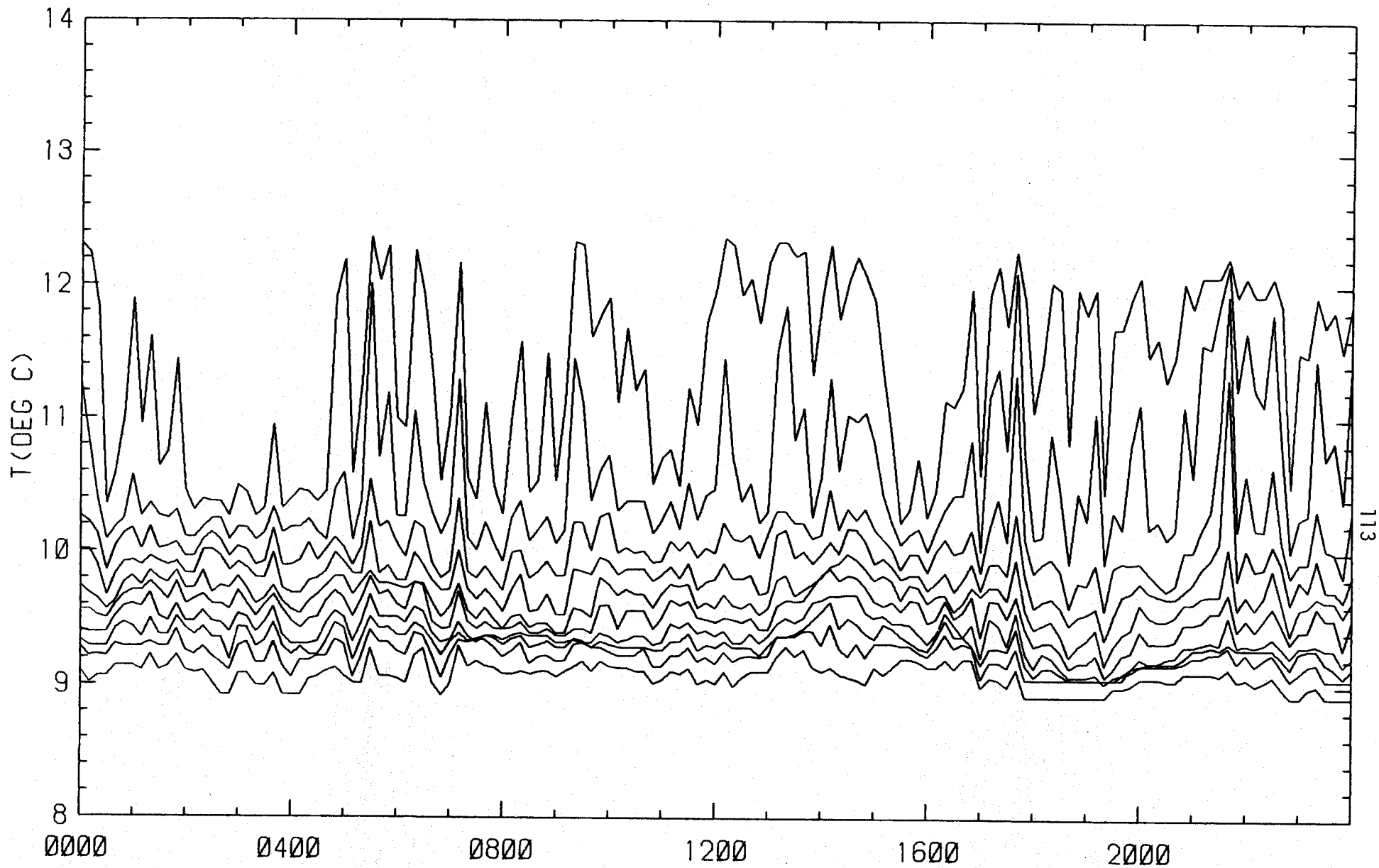
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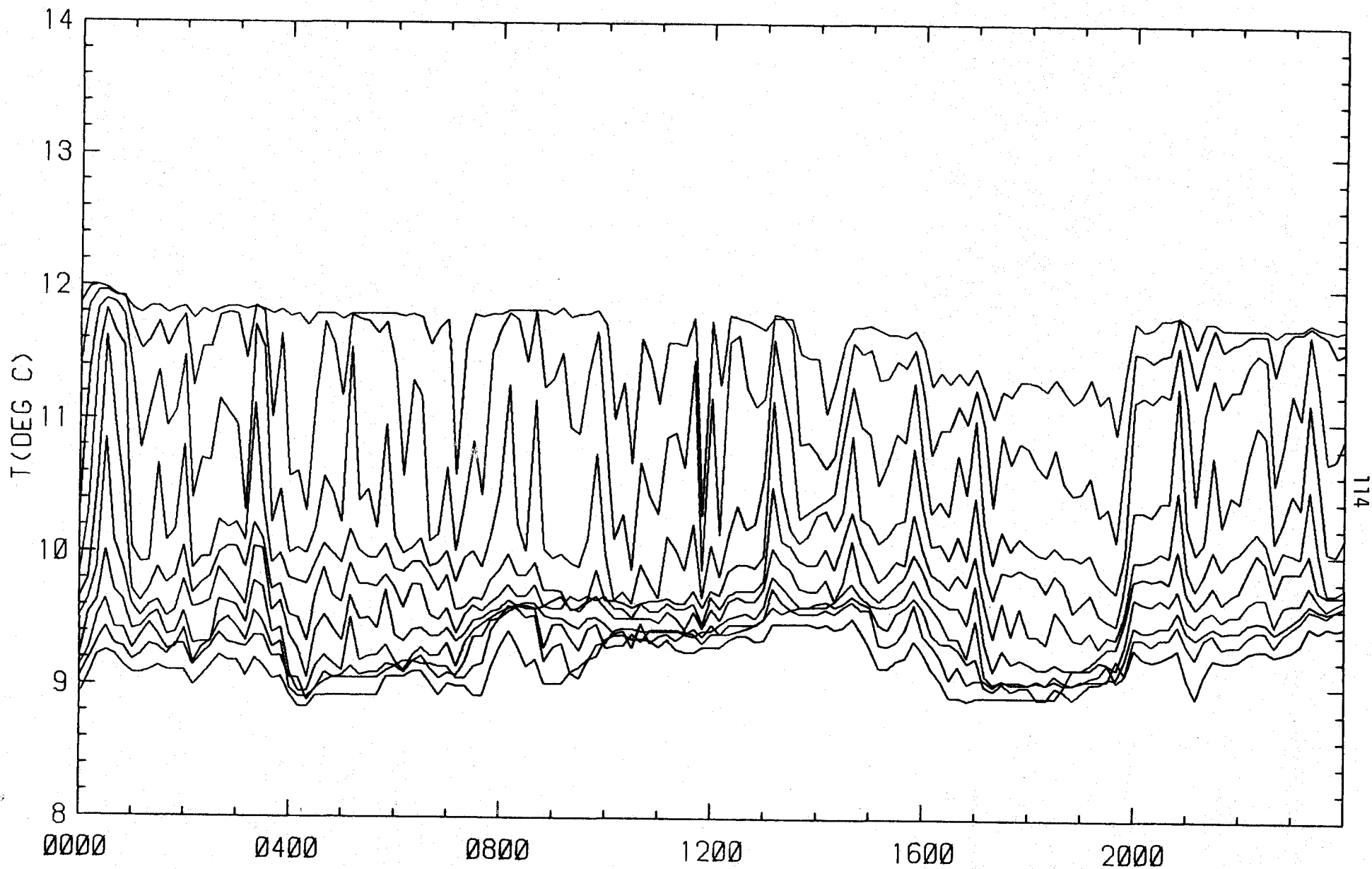
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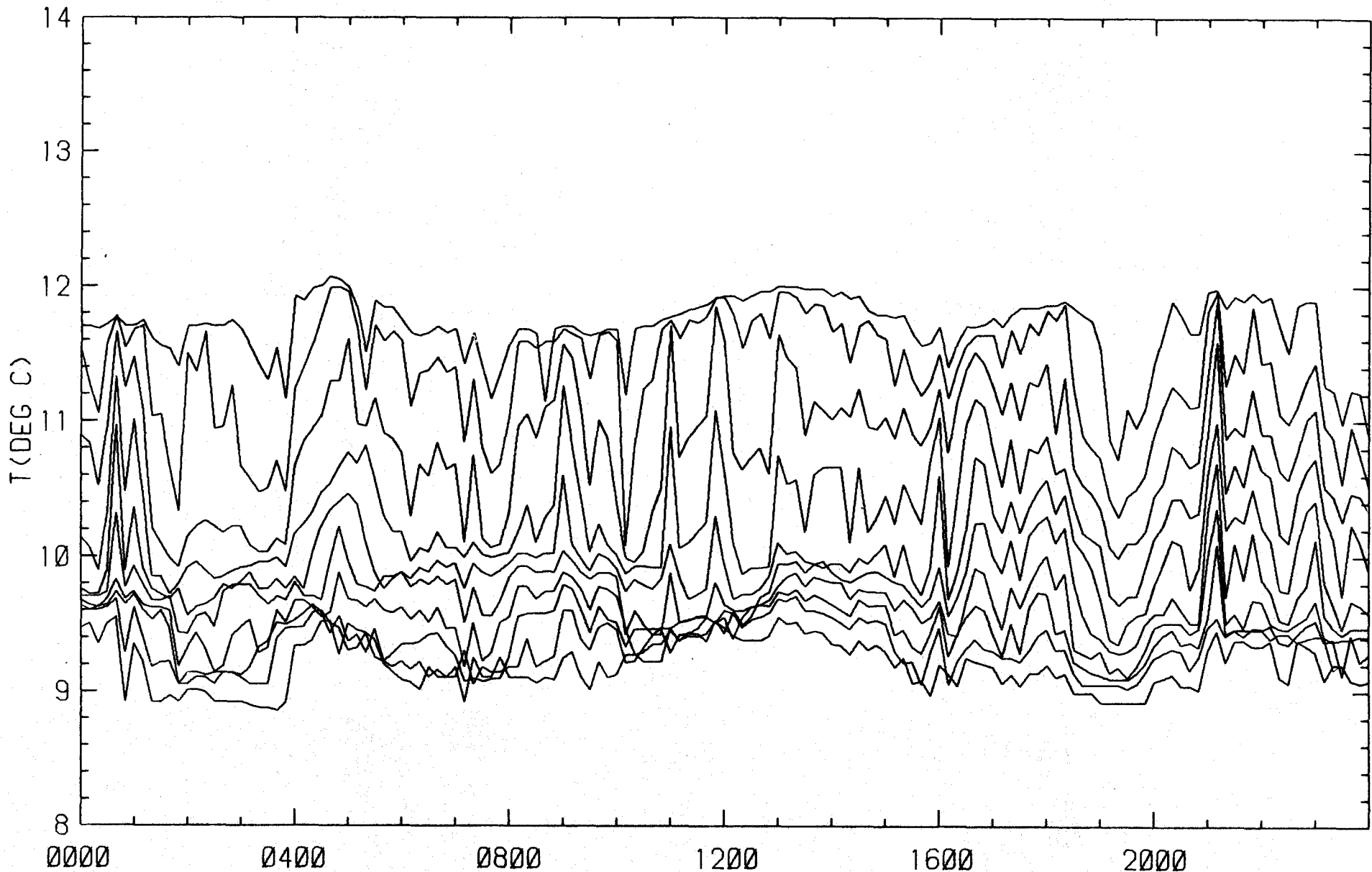
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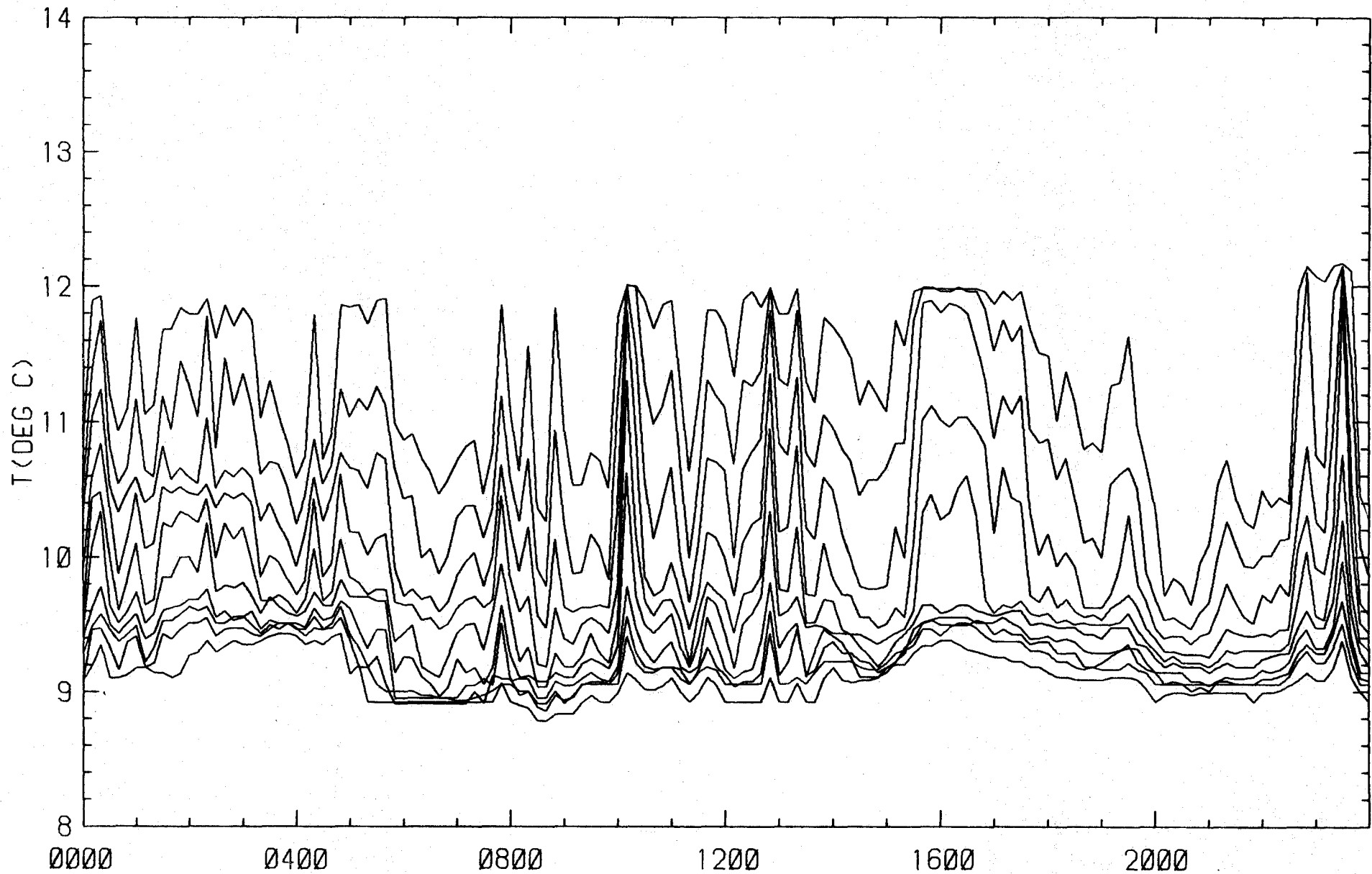


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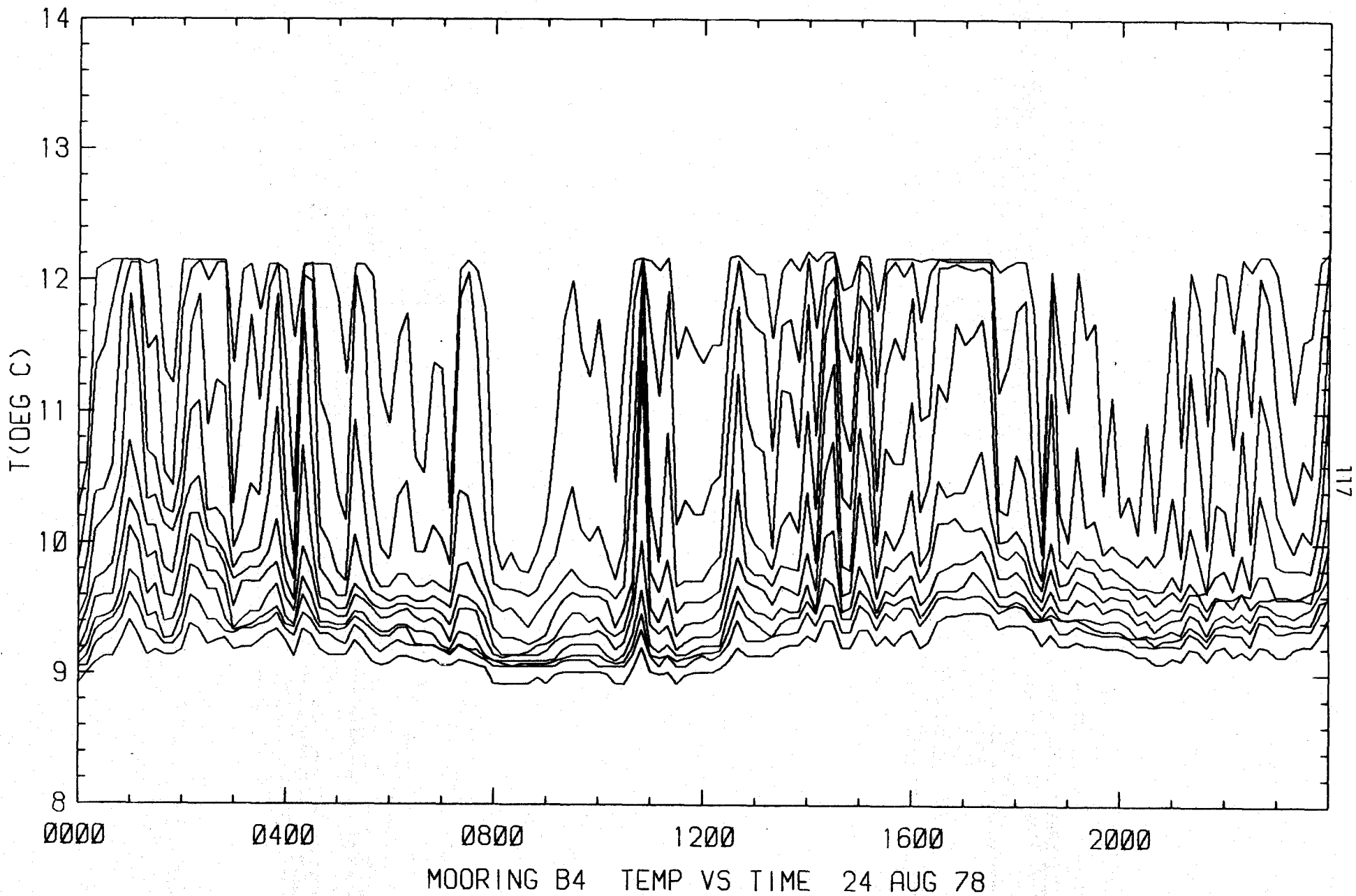
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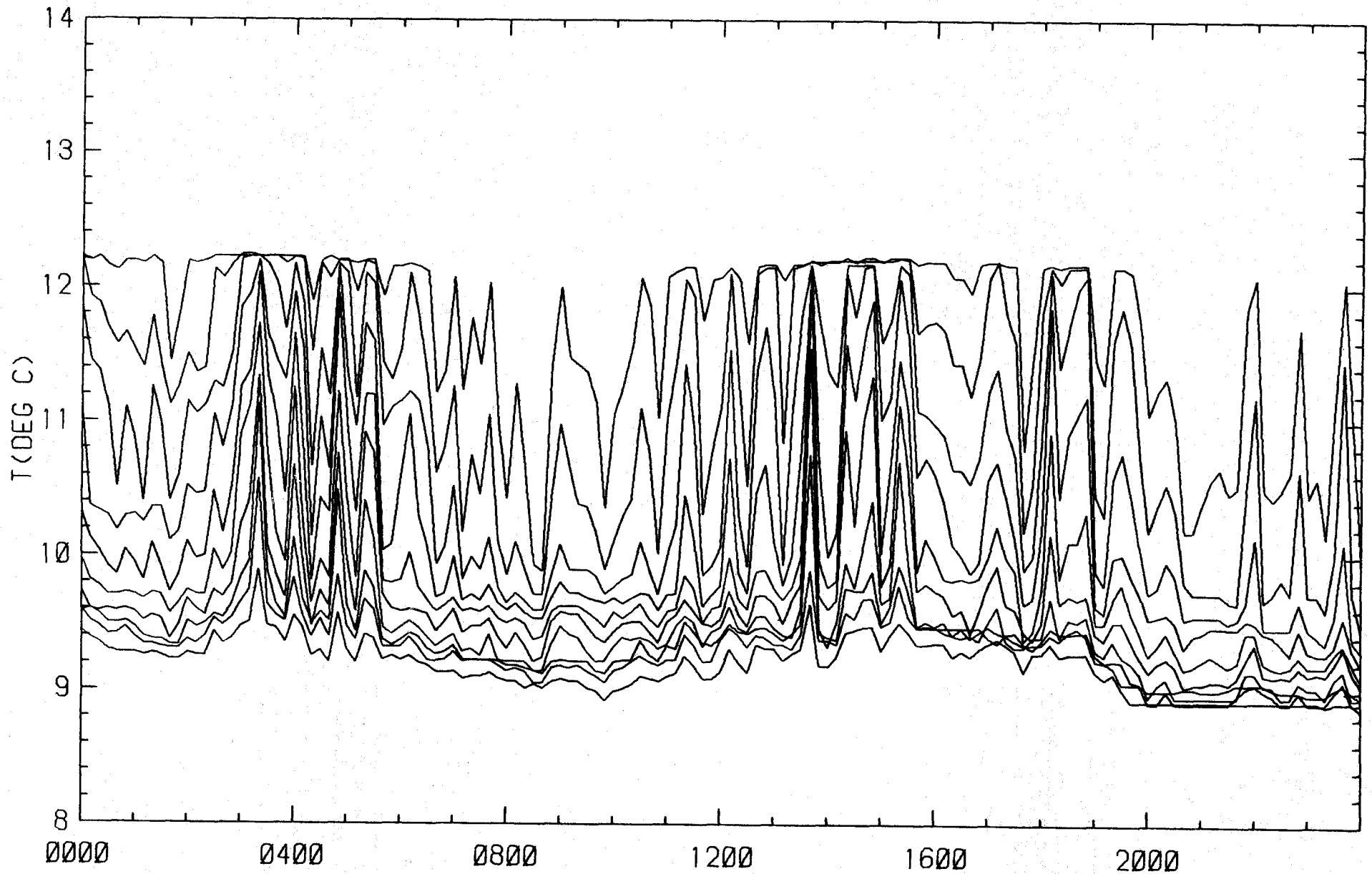


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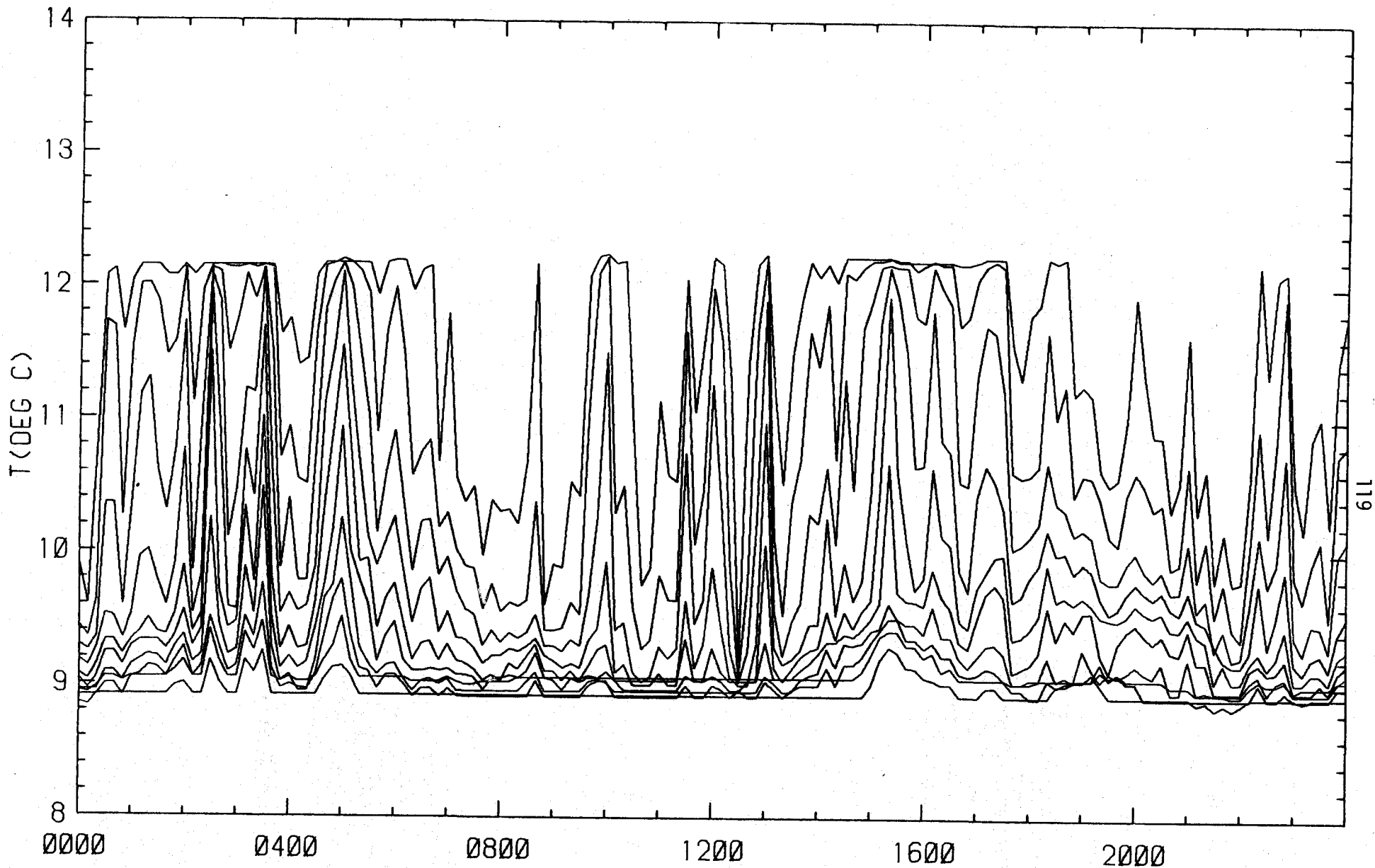


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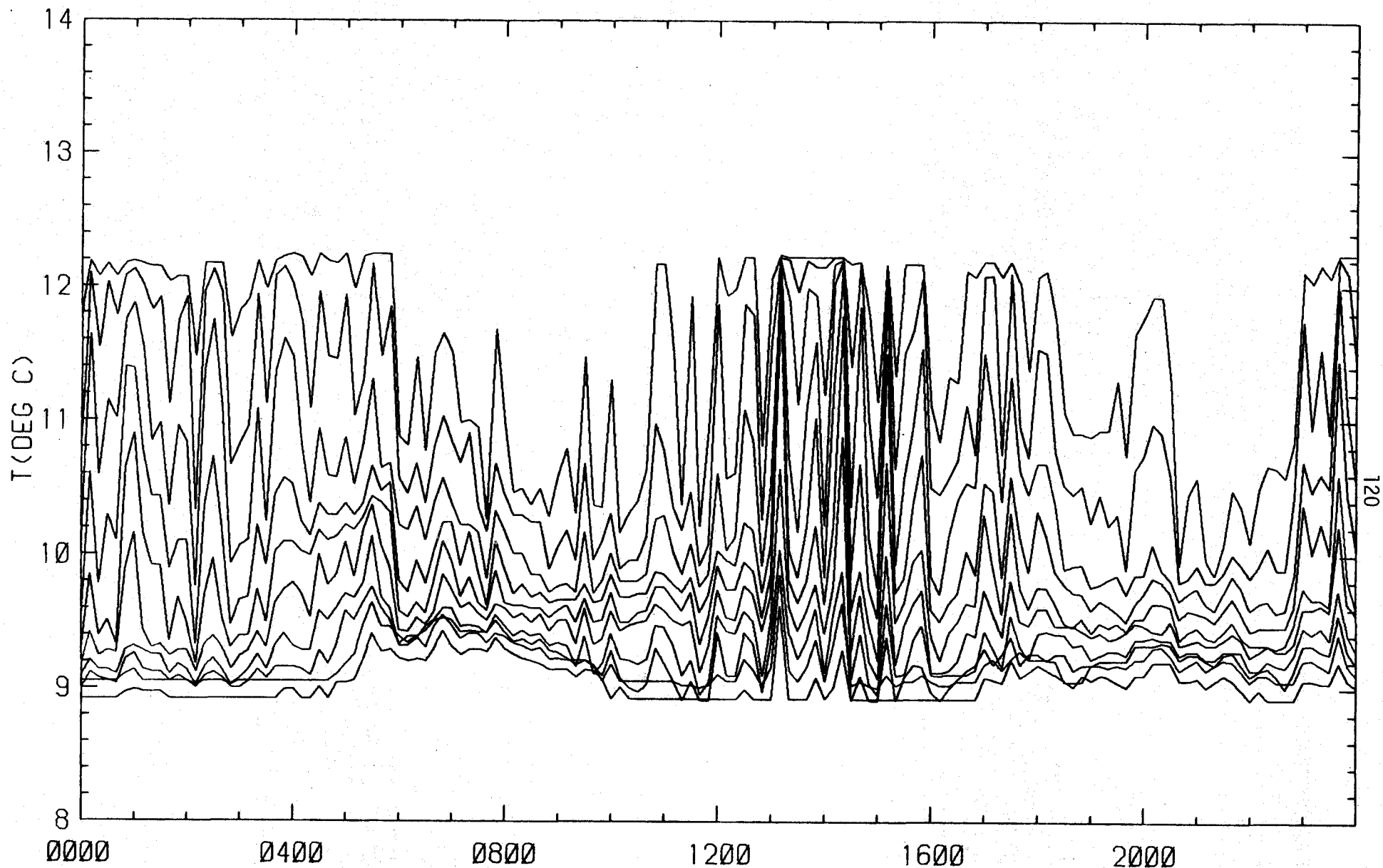




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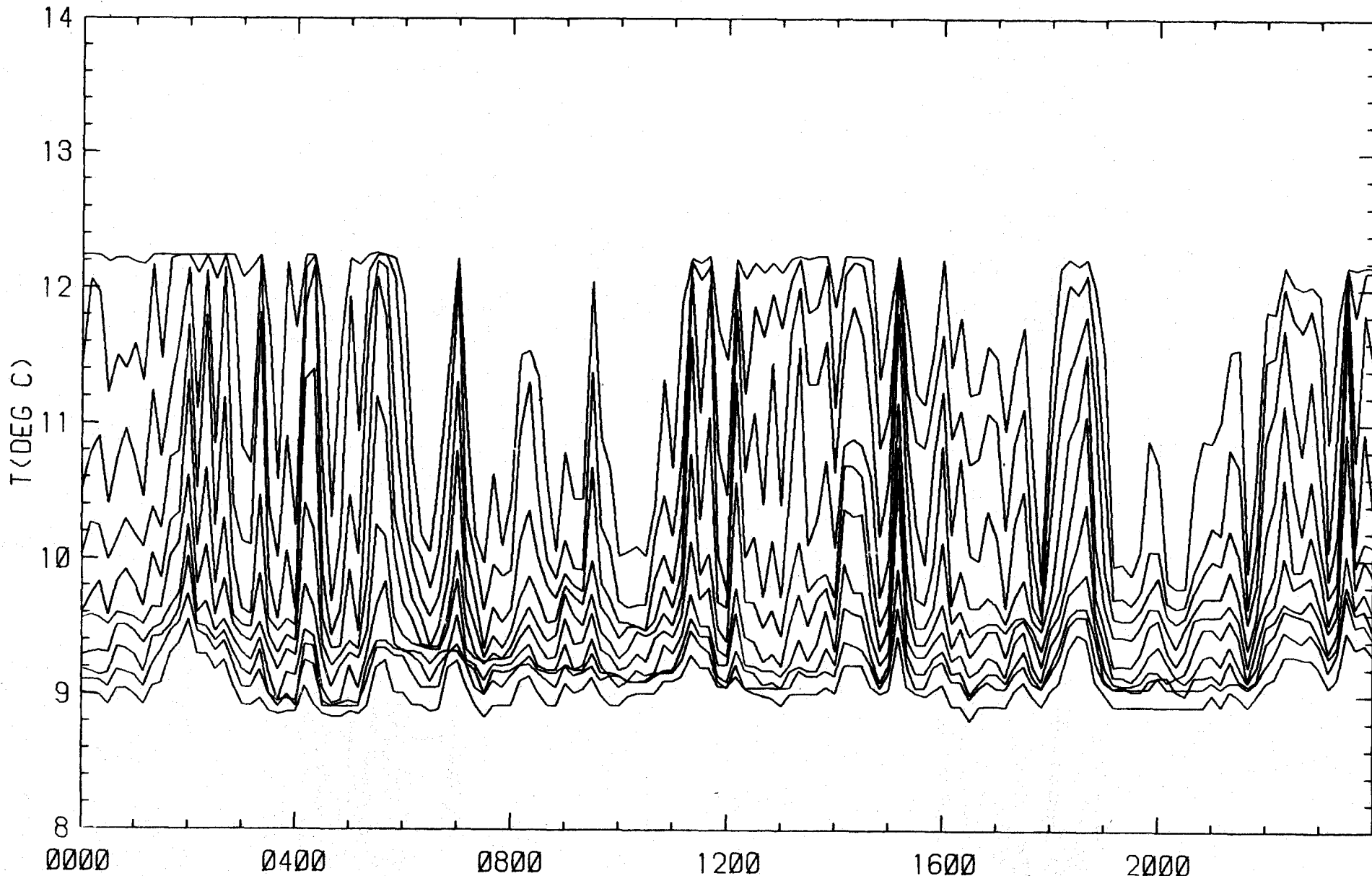
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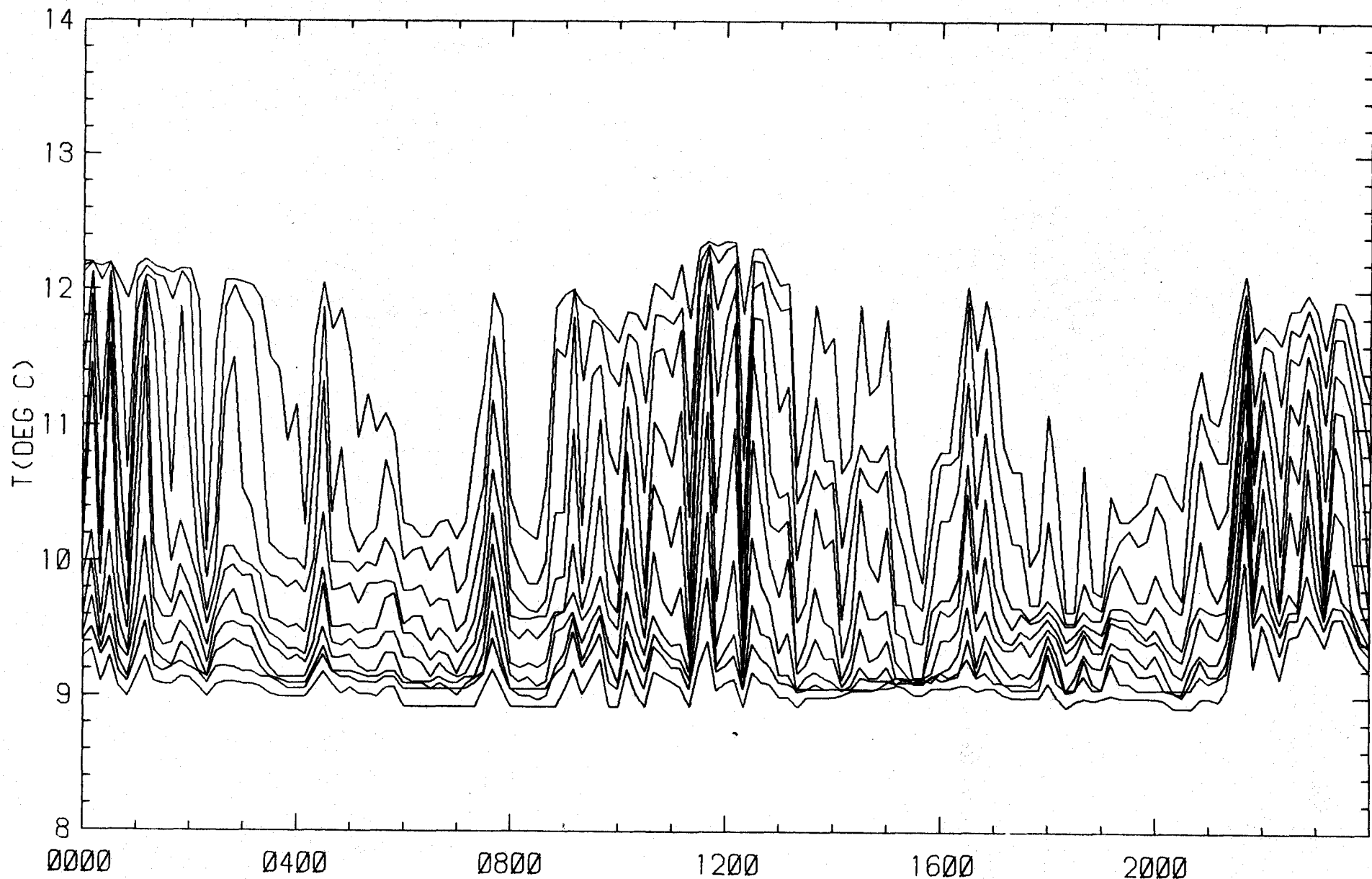
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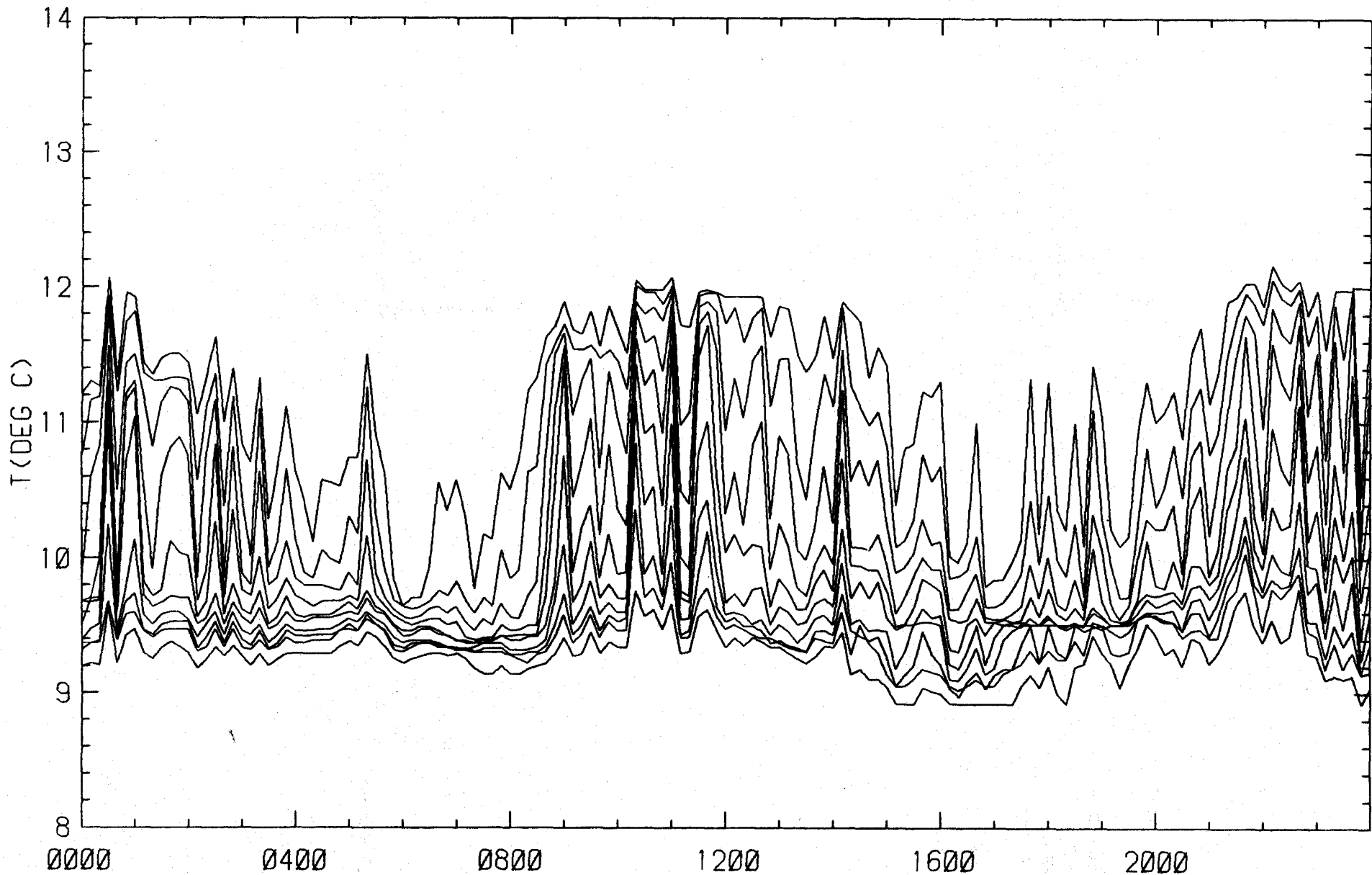


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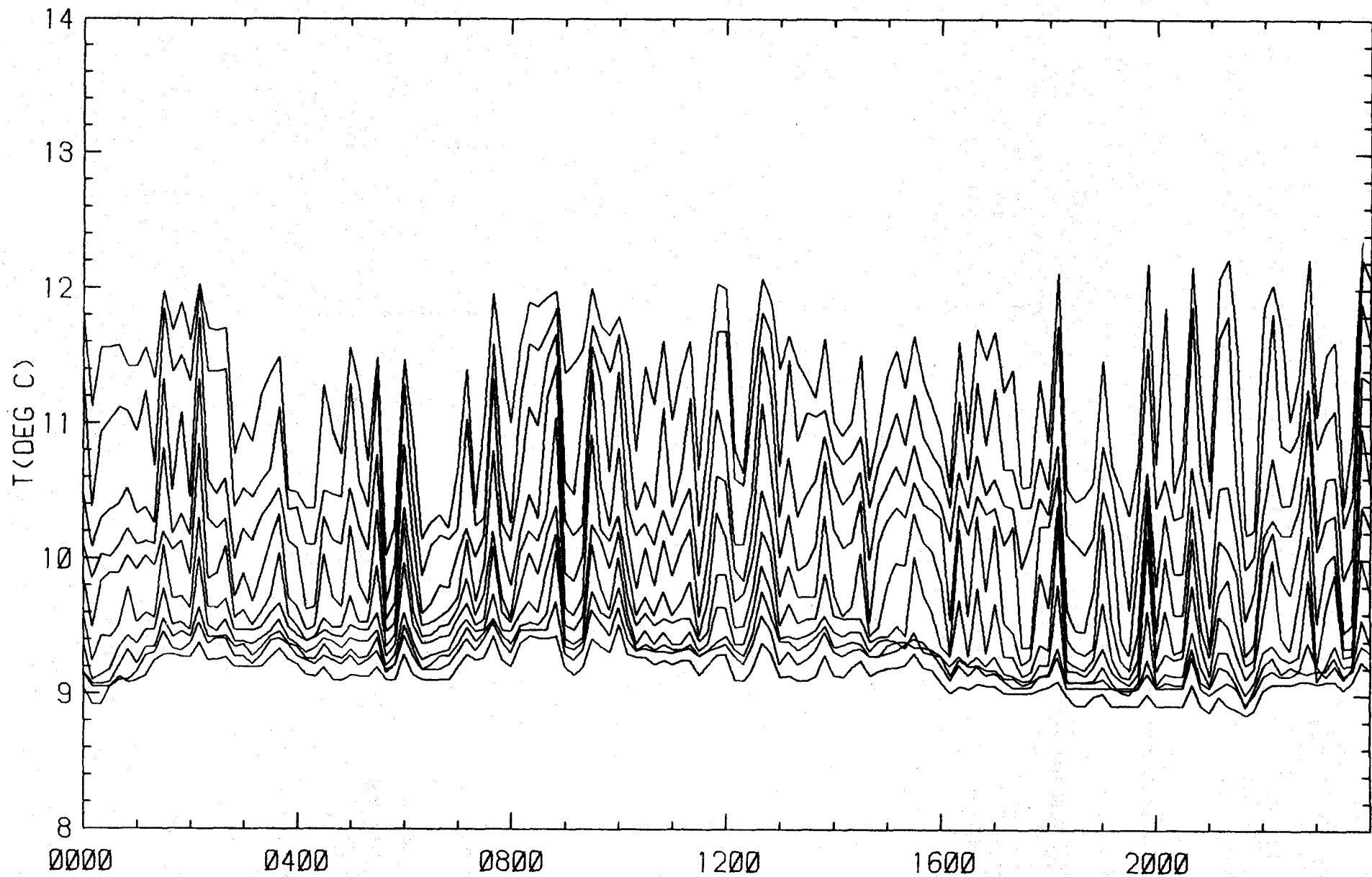
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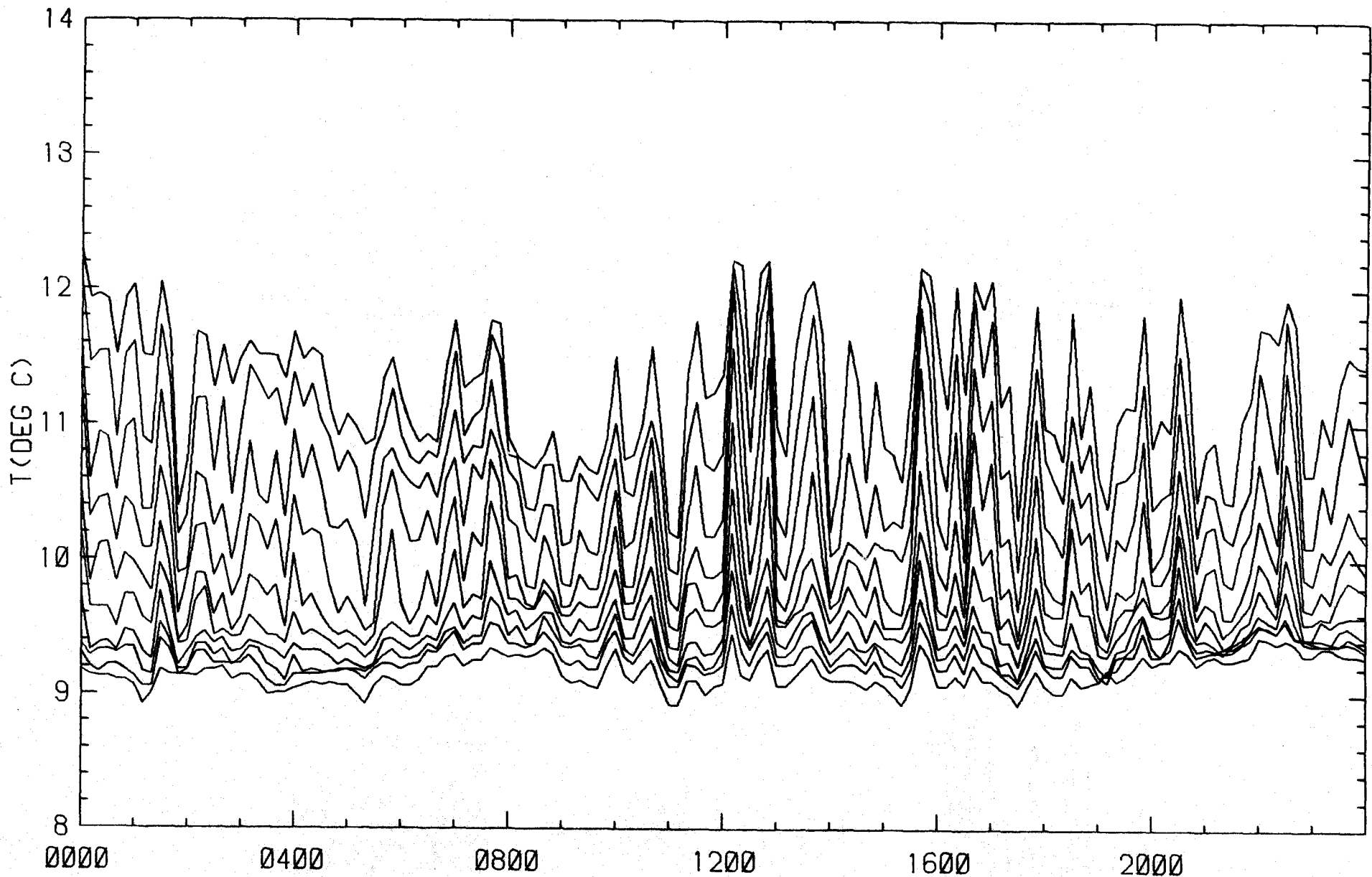
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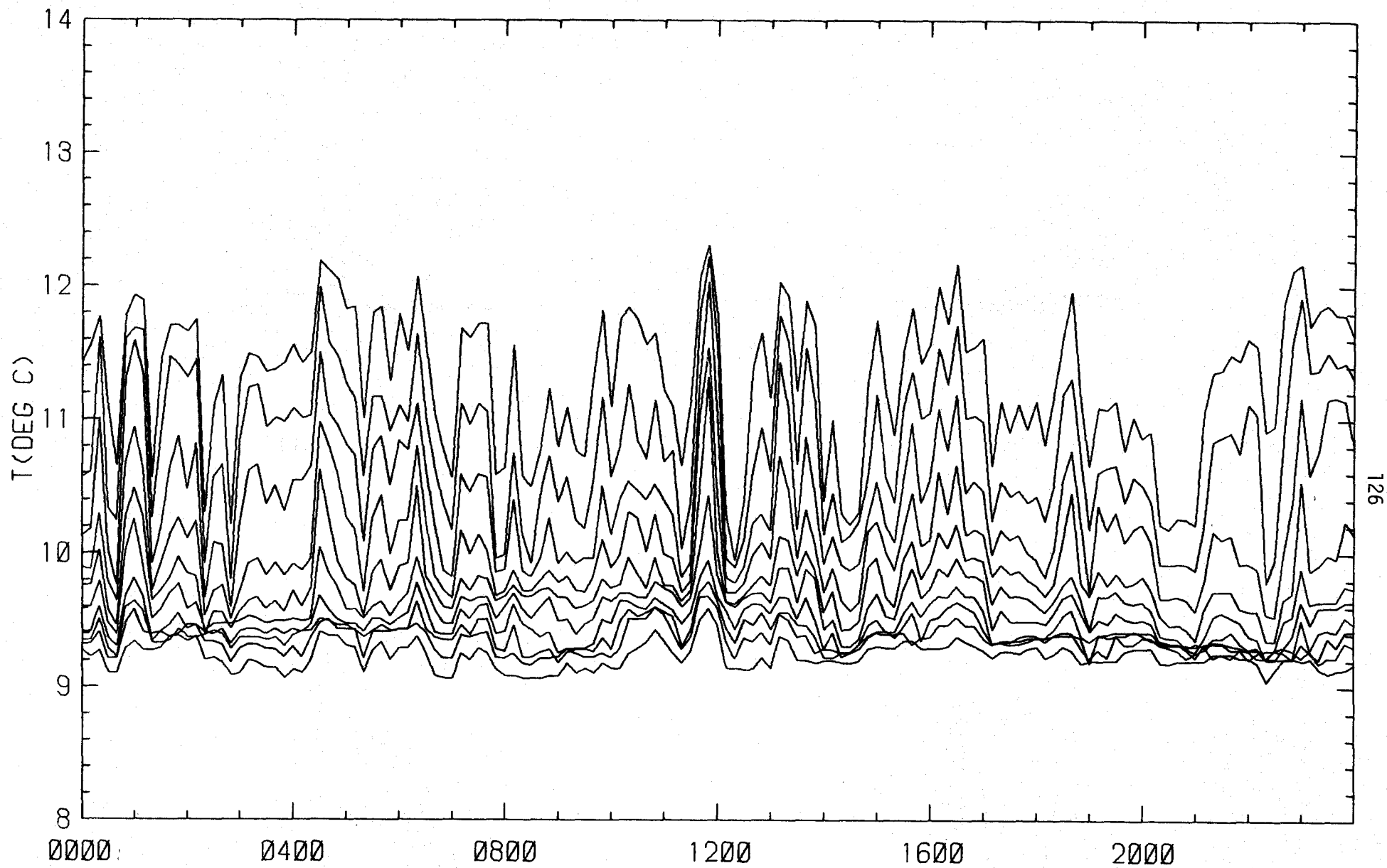
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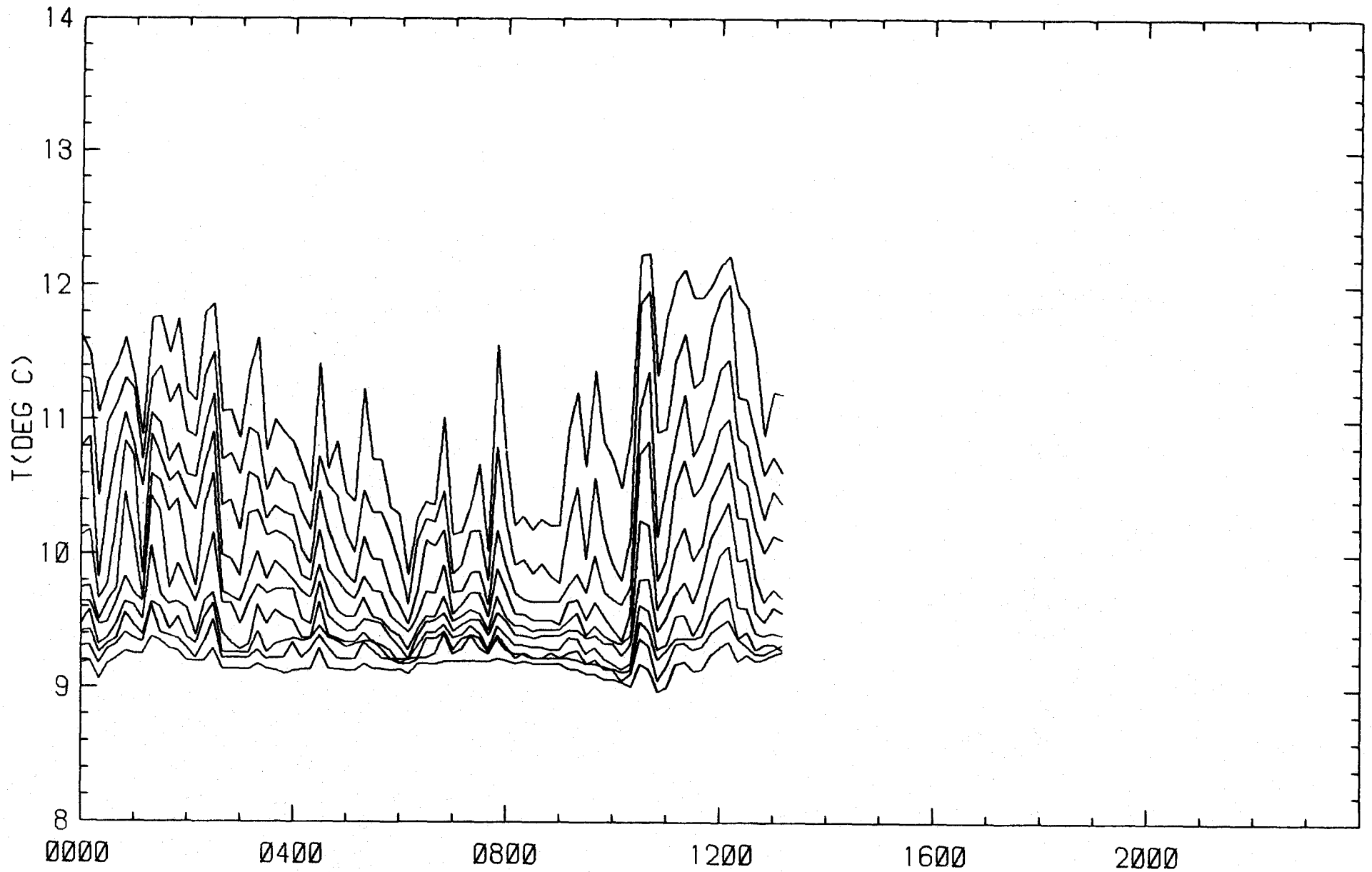
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MOORING B4 TEMP VS TIME 1 SEP 78



MOORING B4 TEMP VS TIME 2 SEP 78



MOORING B4 TEMP VS TIME 3 SEP 78

