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Abundance analysis of targets for the COROT/MONS asteroseismology missions II. Abundance analysis of the COROT main targets

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Abstract

One of the goals of the ground-based support program for the COROT and MONS/RØMER satellite missions is to characterize suitable target stars for the part of the missions dedicated to asteroseismology. We present the detailed abundance analysis of nine of the potential COROT main targets using the semi-automatic software VWA. For two additional COROT targets we could not perform the analysis due to the high rotational velocity of these stars. For five stars with low rotational velocity we have also performed abundance analysis by a classical equivalent width method in order to test the reliability of the VWA software. The agreement between the different methods is good. We find that it is necessary to measure abundances extracted from each line relative to the abundances found from a spectrum of the Sun in order to remove systematic errors. We have constrained the global atmospheric parameters T_{eff} , $\log g$, and $[\text{Fe}/\text{H}]$ to within 70-100 K, 0.1-0.2 dex, and 0.1 dex for five stars which are slow rotators ($v \sin i < 15 \text{ km s}^{-1}$). For most of the stars we find good agreement with the parameters found from line depth ratios, $H\alpha$ lines, Strömgren indices, previous spectroscopic studies, and also $\log g$ determined from the HIPPARCOS parallaxes. For the fast rotators ($v \sin i > 60 \text{ km s}^{-1}$) it is not possible to constrain the atmospheric parameters.

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Keywords

Stars: abundances, Stars: fundamental parameters