

Bay Area Environmental Research Institute
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FINAL PERFORMANCE REPORT

Time Period: January 1, 2002 – June 30, 2005

Project: Cooperative Agreement NCC2-1299 entitled “Analysis of Atmospheric
Aerosol Data Sets and Application of Radiative Transfer Models to Compute Aerosol Effects”

Principal Investigator: Dr. Beat Schmid

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Introduction

The Bay Area Environmental Research Institute (BAER) scientists have worked with the NASA Ames Research Center sunphotometer group led by Dr. Philip Russell for many years researching the climatic effects of aerosol particles in the stratosphere and troposphere.

Under Cooperative Agreement NCC2-1299 we have continued to work with the NASA Ames sunphotometer group in research activities representing funded, peer-reviewed proposals to NASA, NOAA and DOE. The activities are described in those proposals and also in the following documents provided to the Grants Office earlier:

Document	Date
Original proposal (includes Drs. Schmid, Redemann and Bergstrom)	November 8, 2001
Supplemental request (Ms. Ramirez added)	June 14, 2002
Updated Year 2 Budget	December 13, 2002
Supplemental request (Dr. Ricci ¹ added)	June 13, 2003
Supplemental request (Mr. Meriam ² added)	July 11, 2003
Supplemental request	September 24, 2003
Updated Year 3 Budget	November 10, 2003
Extension of performance period	October 12, 2004

This report is the final report for the Cooperative Agreement NCC2-1299. January 1, 2002 – June 30, 2005. The report consists of a compilation of **41** peer-reviewed publications (published, in press or submitted) produced under this Cooperative Agreement and **43** first-authored conference presentations. To save paper, reprints are not included but will, of course, be provided upon request.

¹ With BAER Institute 7/1-12/30/2003

² With BAER Institute 8/1/2003-9/30/2004

**List of Publications,
January 1, 2002 – June 30, 2005**

Peer-reviewed papers

2002

1. **Bergstrom, R. W.**, P. B. Russell, and P. Hignett, Wavelength dependence of the absorption of black carbon particles: Predictions and results from the TARFOX experiment and implications for the aerosol single scattering albedo, *J. Atmos. Sci.*, 59, 568-578, 2002.
2. Russell P. B., **J. Redemann, B. Schmid, R. W. Bergstrom**, J. M. Livingston, D. M. McIntosh, S. Hartley, P. V. Hobbs, P. K. Quinn, C. M. Carrico, M. J. Rood, E. Öström, K. J. Noone, W. von Hoyningen-Huene, and L. Remer, Comparison of aerosol single scattering albedos derived by diverse techniques in two North Atlantic experiments, *J. Aerosol Sci.*, Vol. 59, No. 3, 609-619, 2002.
3. McGill M., D. Hlavka, W. Hart, J. Spinhire, S. Scott, and **B. Schmid**, The Cloud Physics Lidar: Instrument Description and Initial Measurement Results, *Applied Optics-LP*, Volume 41, Issue 18, 3725-3734, June 2002.
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12. Magi, B. I., P. V. Hobbs, **B. Schmid**, and **J. Redemann**, Vertical profiles of light scattering, light absorption and single scattering albedo during the dry, biomass burning season in southern Africa and comparisons of in-situ and remote sensing measurements of aerosol optical depths, *J. Geophys. Res.*, 108(D13), 8504, doi:10.1029/2002JD002361, 2003.
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17. Wang, J., S. A. Christopher, F. J. Brechtel, J. Kim, **B. Schmid**, **J. Redemann**, P. B. Russell, P. K. Quinn, and B. Holben, Geostationary satellite retrievals of aerosol optical thickness during ACE-Asia, *J. Geophys. Res.*, 108(D23), 8657, doi:10.1029/2003JD003580, 2003.

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40. Kuzmanoski M., M. Box, **B. Schmid**, G. P. Box, J. Wang, P. Russell, H. Jonsson, and J. Seinfeld, Aerosol properties computed from aircraft-based observations during the ACE-Asia campaign: 1. Aerosol size distributions retrieved from optical thickness measurements, *J. Geophys. Res.* # 2005JD006254, submitted.
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First-authored conference papers

2002

1. **Bergstrom, R. W.**, P. Pilewskie, **B. Schmid**, and P. B. Russell, Measurements and Calculations of Solar Spectral Radiative Forcing by Aerosols during PRIDE, SAFARI 2000 and ACE-Asia. IAMAS/GACP/IGAC, Crete, Greece, 18-25 September 2002.
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3. **Redemann, J.**, **B. Schmid**, J. M. Livingston, P. B. Russell, J. E. Eilers, P. V. Hobbs, R. Kahn, W. L. Smith Jr., B. Holben, K. Rutledge, Airborne Sunphotometry in Support of the Chesapeake Lighthouse and Aircraft Measurements for Satellites (CLAMS) Experiment, 2001, Invited Presentation at the 1 st CLAMS Data Workshop, Washington, D.C., February 27-28, 2002.
4. **Redemann, J.**, **B. Schmid**, J. M. Livingston, P. B. Russell, J. A. Eilers, P. V. Hobbs, R. Kahn, W. L. Smith Jr., B. N. Holben, C. K. Rutledge, M. C. Pitts, M. I. Mishchenko, B. Cairns, J. V. Martins, and T. P. Charlock, Airborne Measurements of Aerosol Optical Depth and Columnar Water Vapor in Support of the Chesapeake Lighthouse and Aircraft Measurements for Satellites (CLAMS) Experiment, 2001, Abstracts, 11th Conference on Atmospheric Radiation, American Meteorological Society, Ogden, UT, June 3-7, pp. 20, 2002.
5. **Redemann, J.**, **B. Schmid**, J. M. Livingston, P. B. Russell, J. A. Eilers, R. Kolyer, **S. Ramirez**, R. Kahn, N. C. Hsu, J. Wang, S. Masonis, T. Anderson, D. R. Collins, R. Flagan, J. H. Seinfeld, H. Jonsson, D. Hegg, D. S. Covert, A. Clark, S. Howell, and C. McNaughton, Airborne Sunphotometer Measurements of Aerosol Optical Depth and Water Vapor in ACE-Asia and their Comparisons to Correlative Measurements and Calculations, Abstracts, 11th Conference on Atmospheric Radiation, American Meteorological Society, Ogden, UT, June 3-7, pp. 35, 2002.
6. **Redemann, J.**, **B. Schmid**, J. Livingston, P. Russell, J. Eilers, R. Kolyer, **S. Ramirez**, R. Kahn, C. Hsu, J. Wang, S. Masonis, T. Anderson, D. R. Collins, R. Flagan, J. Seinfeld, H. Jonsson, D. Hegg, D. Covert, A. Clarke, S. Howell, and C. McNaughton, Airborne measurements of aerosol-radiation interactions in ACE-Asia, Invited Presentation at the 5th International APEX workshop, Miyazaki, Japan, July 3-5, 2002.
7. **Redemann J.**, **B. Schmid**, J. Livingston, P. Russell, D. Hegg, J. Wang, R. Kahn, C. Hsu, S. Masonis, T. Murajama, D. Bates, E. Welton, T. Anderson, D. Covert, R. Flagan, J. Seinfeld, H. Jonsson, A. Clarke, S. Howell, C. McNaughton, L. Remer, and P. Durkee, Airborne sunphotometer measurements of aerosol optical depth and water vapor in ACE-Asia and their comparison to correlative measurements, IAMAS/GACP/IGAC, Crete , Greece , 18-25 September 2002.
8. **Redemann J.**, **B. Schmid**, P. Russell, R. Bergstrom, J. Livingston, S. Masonis, T. Anderson, A. Clarke, J. Seinfeld, R. Flagan, J. Wang, L. Remer, C. Hsu, and P. Durkee, Combining suborbital and satellite measurements of the spatial distributions of aerosol optical depth and water vapor to assess shortwave aerosol radiative forcing during ACE-Asia, 2001, AAAR Annual Meeting, Oct 7-11, Charlotte, NC, 2002.
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11. **Schmid B.**, **J. Redemann**, J. Livingston, P. Russell, D. Hegg, J. Wang, R. Kahn, C. Hsu, S. Masonis, T. Murayama, D. Bates, E. Welton, D. Covert, R. Flagan, J. Seinfeld, H. Jonsson, A. Clarke, S. Howell, C. McNaughton, L. Remer, P. Durkee, T. Anderson, and O. Torres, Airborne sunphotometer measurements of aerosol optical depth and water vapor in ACE-Asia and their comparisons to correlative measurements, Western Pacific Geophysics Meeting, Wellington, New Zealand, 9-12 July 2002.
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14. **Bergstrom R.**, P. Pilewskie, **B. Schmid** and P. Russell, The Spectral Absorption of Dust and Biomass Burning Aerosols Derived from Airborne Field Observations, IUGG 2003, June 30-July 11, Sapporo, Japan.
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16. **Redemann J.**, Spatial variability of aerosol optical depth off the US East Coast, CALIPSO science team meeting, Williamsburg, VA, Nov. 19-20, 2003.
17. **Redemann J.**, S. Masonis, **B. Schmid**, T. Anderson, P. Russell, J. Livingston, and A. Clarke, A spring-time model of the vertical structure of aerosol properties in the Asian region based on closure studies in ACE-Asia, 2001: Impact on the vertical structure of aerosol-induced flux changes and heating rates, AAAR 2003 Annual Conference, Anaheim, California, October 20-24, 2003.
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