

EDUCATION:

1969	B.S.	Indian Institute of Technology, Kharagpur
1971	M.S.	Indian Institute of Science, Bangalore
1976	Ph.D.	State University of New York, Stony Brook

PROFESSIONAL EXPERIENCE:

2009-present	Associate Dean, Graduate Education and International Programs, College of Science, Purdue University
1996-2004	Head, Department of Earth and Atmospheric Sciences, Purdue University
1994-present	Professor, Department of Earth and Atmospheric Sciences, Purdue University
1988-1994	Associate Professor, Department of Earth and Atmospheric Sciences, Purdue University
1978-1988	University Research Associate, Laboratory for Atmospheres, NASA/Goddard Space Flight Center
1977-1978	Resident Research Associate, Laboratory for Atmospheric Sciences, NASA/Goddard Space Flight Center
1973-1976	Research Assistant, Department of Mechanics, S.U.N.Y.
1971-1973	Teaching Assistant, Department of Mechanics, S.U.N.Y.

HONORS AND AWARDS:

1977	National Research Council Resident Research Associate
1993	Henry G. Houghton Award, American Meteorological Society
1999	Fellow, American Meteorological Society

ADMINISTRATIVE ACTIVITIES:

Purdue University

1990-93	Member, University Senate Member, Student Affairs Committee of the University Senate (Recording Secretary, 1991-93)
2005-08	Member, Graduate Council (Chair, committee on engineering, chemistry, physical sciences, 2006-08)

Department of Earth and Atmospheric Sciences

1988-93	Member, Graduate Committee
1988-90	Member, Library Committee
1990-94	Liaison, Oral English Proficiency Program
1990-91	Chairman, Climate Faculty Search Committee
1993-94	Chairman, Atmospheric Chemistry Faculty Search Committee
1993-94	Chairman, Undergrad Curriculum Committee
1994-96	Member, Undergraduate Committee
1995-96	Chairman, Undergraduate Committee
1995-96	Associate Head, Dept. of Earth & Atmospheric Sciences
1996-2004	Head, Dept. of Earth & Atmospheric Sciences
2005-06	Chairman, Graduate Committee

School (now College) of Science

1990-91	Member, Environment - Global Change Committee
1994-95	Member, Distinguished Professor Screening Committee
1994-95	Member, Undergraduate Recruitment Committee
1996-2004	Member, Purdue Accelerator Mass Spectrometry Committee (Chair, 1998-2001)
2005-2008	Member, Graduate Education Policy and Curriculum Committee
2009-present	Associate Dean, Graduate Education and International Programs

Community

2003-2009	Friends of Convocations Advisory Board (President, 2005-08)
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PROFESSIONAL ACTIVITIES:

Membership

1979-	Member, American Geophysical Union (AGU)
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1980- Member, American Meteorological Society (AMS)
 1988-91 Member, Committee on Atmospheric Radiation, AMS
 1998-2000 Member, AGU Heads & Chairs Executive Committee
 2005- Member, Institute of Electrical & Electronics Engineers (IEEE)

Visiting Scientist

1981 National Center for Atmospheric Research, Boulder, CO
 1994 Max Planck Institute for Meteorology, University of Hamburg, Germany
 1994 National Centre for Medium Range Weather Forecasting, New Delhi, India
 2002 Goddard Earth Sciences and Technology Center, Greenbelt, MD
 2008 Program in Atmospheric and Oceanic Sciences, Princeton University, Princeton, NJ

Editorial Duties

1991-93 Associate Editor, Journal of Applied Meteorology
 1992-94 Associate Editor, Journal of the Atmospheric Sciences
 1996-2001 Editor, Journal of Applied Meteorology

Invited Participant (since 1990)

1990 *Workshop on Clouds, Radiation and Climate sponsored by the Department of Meteorology, University of Maryland, College Park, MD
 Planning meeting for the Atmospheric Radiation Measurement (ARM) program, Department of Energy, Argonne National Laboratory, Argonne, IL
 *Indo-U.S. Seminar on the Parameterization of Subgrid-Scale Processes in Dynamical Models of Medium-Range Prediction and Global Climate, Pune, India
 Contributor to the US Quadrennial Report to the XX General Assembly of the IUGG, Vienna, Austria

1991 *Meeting of the Committee on Meteorological Analysis, Prediction and Research of the Board on Atmospheric Science and Climate (National Research Council), Washington, D.C
 Workshop on critical areas in Heat Transfer, NSF Chemical and Thermal Systems Division, Chicago, IL
 *Workshop on water vapor, clouds, radiative processes and climate; inferences from recent satellite observations, NOAA Geophysical Fluid Dynamics Laboratory, Princeton, NJ
 *ECMWF/GEWEX Workshop on Hydrology and Surface Radiation in Atmospheric Models, European Centre for Medium Range Weather Forecasts, Reading, U.K.

1992 Foreign Applied Sciences Assessment Center Panel on Climate Research in the former Soviet Union, sponsored by Department of Energy, SAIC, McLean, VA
 *Third International Cloud Modeling Workshop, WMO Workshop on Cloud Microphysics and Applications to Global Change, Toronto, Canada

1994 Workshop on Ozone: Its Climate and Related Impacts, Argonne National Laboratory, Argonne, IL.
 Dahlem Conference on Aerosol Forcing of Climate, Berlin, Germany
 *Aspen Global Change Institute workshop on Radiation Feedbacks and the Credibility of Atmospheric Models, Aspen, CO

1995 Air Quality Criteria for Particulate Matter and Sulfur Oxides, U.S. EPA, Research Triangle Park, NC
 1996 ARM/CHAMMP/PCMDI Workshop on Improving the Representation and Diagnosis of Solar Radiative Heating in Climate Models, U.S. DOE, Sequim, WA
 Panel Review, NASA Earth System Science Pathfinder Program, Washington, DC
 Panel Review, NASA AM-1 Platform Instrument Algorithm Theoretical Basis Documents, Columbia, MD

1997 Panel Review, NOAA/NASA Enhanced Data Sets for Analysis and Applications, Asheville, NC
 Panel Review, NASA, Satellite Remote Sensing Measurement Accuracy, Variability, and Validation Studies, Crystal City, VA

1998 *Gordon Research Conference, Solar Radiation and Climate, Plymouth, NH
 *Global Aerosol Climatology Project, Aerosol Radiative Forcing Science Team, NASA GISS, New York, NY

2000 Gordon Research Conference, Solar Radiation and Climate, New London, CT
 Workshop on Monitoring Global Aerosol Forcing of Climate, GFDL, Princeton, NJ
 *Third Global Aerosol Climatology Project Science Team Meeting, Lanham –Seabrook, MD

2005 IGAC specialty conference on the indirect effects of aerosols on climate, Manchester, UK
 2006 *Aerosol Workshop on Climate Prediction Uncertainties, Santa Fe, NM
 2008 Aviation-Climate Change Research Initiative, Virginia Beach, VA
 * including invited lecturer

Invited Lectures & Seminars (since 1998)

- 1998 Department of Meteorology, Florida State University, Tallahassee, FL, February 27
Marine Meteorology Division, Naval Research Laboratory, Monterey, CA, March 9
- 2001 Department of Atmospheric Sciences, University of Illinois, Urbana-Champaign, September 5
- 2002 Lawrence Livermore National Laboratory, Livermore, CA, May 10
Naval Research Laboratory, Monterey, CA, May 14
NASA Ames Research Center, Moffett Field, CA, May 16
Brookhaven National Laboratory, Upton, NY, August 27
Goddard Space Flight Center, Greenbelt, MD, September 25
NOAA Geophysical Fluid Dynamics Laboratory, Princeton, NJ, September 26
NCAR Climate and Global Dynamics Division, Boulder, CO, October 8
Department of Atmospheric & Oceanic Sciences, U. of Wisconsin, Madison, WI, November 4
Center for Ocean-Land-Atmosphere, Calverton, MD, November 13
Department of Physics, Howard University, Washington, DC, November 20
Naval Research Laboratory, Washington, DC, November 21
- 2005 ESSIC (Earth System Science Interdisciplinary Center), University of Maryland, College Park, MD, January 31
Optical Society of America topical meeting on Hyperspectral Imaging and Sounding of the Environment, Alexandria, VA, February 1
- 2006 Department of Atmospheric Sciences, U. of Illinois, Urban-Champaign, IL, September 28
Department of Environmental Sciences, Rutgers University, New Brunswick, NJ, June 5
NOAA Geophysical Fluid Dynamics Laboratory, Princeton, NJ, June 5
- 2008 NOAA Geophysical Fluid Dynamics Laboratory, Princeton, NJ, July 9, 23
NASA Goddard Institute for Space Studies, New York, NY, August 13
Department of Environmental Sciences, Rutgers University, New Brunswick, NJ, August 14
NASA Goddard Space Flight Center, Climate & Radiation Branch, Greenbelt, MD, December 3
National Centers for Environmental Prediction, Camp Springs, MD, December 4

Journal Reviewer

Journal of Applied Meteorology
Journal of the Atmospheric Sciences
Journal of Climate
Bulletin of the American Meteorological Society
Journal of Geophysical Research (Atmospheres)
Journal of the Meteorological Society of Japan
Atmospheric Research
Theoretical and Applied Climatology
Climate Dynamics
Earth Science Reviews
Quarterly Journal of the Royal Meteorological Society
Geophysical Research Letters

Proposal Reviewer

NASA Office of Space Science and Applications
NASA Mission to Planet Earth
NSF Division of Atmospheric Sciences
NSF Office of Science and Technology
Air Force Office of Scientific Research
Department of Energy Atmospheric Radiation Measurement Program
US Civilian Research & Development Foundation
Netherlands Organization for Scientific Research NOW
NASA Science Mission Directorate

Program Reviewer

Climate and Global Dynamics Division, National Center for Atmospheric Research
NSF Graduate Research Fellowship Program (geoscience panel)

COURSES TAUGHT:

<u>Year</u>	<u>Number</u>	<u>Course Title</u>	<u>Credits</u>	<u>Undergraduate</u>	<u>Graduate</u>
1988/89	ATMS 531	Introduction to Atmospheric Physics	3	8	6
	ATMS 638	Atmospheric Radiation	3		6

1989/90	ATMS 133	Profession of Meteorology	0	31	
	ATMS 531	Introduction to Atmospheric Physics	3	13	3
	ATMS 541	Theory of Climate	3	1	7
1990/91	ATMS 133	Profession of Meteorology	0	28	
	ATMS 533	Atmospheric Physics II	3	7	2
	ATMS 230	Introduction to Atmos. Sci.	3	182	
	ATMS 240	Atmospheric Science Lab	1	26	
1991/92	ATMS 133	Profession of Meteorology	0	31	
	ATMS 533	Atmospheric Physics II	3	5	6
	ATMS 638	Atmospheric Radiation	3		3
1992/93	ATMS 133	Profession of Meteorology	0	40	
	ATMS 533	Atmospheric Physics II	3	11	4
	ATMS 230	Introduction to Atmos. Sci.	3	213	
	ATMS 240	Atmospheric Science Lab	1	37	
1993/94	ATMS 133	Profession of Meteorology	0	36	
	ATMS 533	Atmospheric Physics II	3	10	3
	ATMS 230	Introduction to Atmos. Sci.	3	184	
	ATMS 240	Atmospheric Science Lab	1	20	
	ATMS 245	Atmos. Observations & Measure.	1	15	
1994/95	GEOS 191E	Survey of Earth System Sciences	3	6	
	ATMS 533	Atmospheric Physics II	3	8	5
	ATMS 638	Atmospheric Radiation	3		4
1995/96	ATMS 533	Atmospheric Physics II	3	11	2
	ATMS 230	Introduction to Atmos. Sci.	3	190	
	ATMS 240	Atmospheric Science Lab	1	24	
1996/97	ATMS 533	Atmospheric Physics II	3	17	1
	ATMS 235	Science of the Atmosphere	3	27	1
1997/98	ATMS 533	Atmospheric Physics II	3	14	2
	ATMS 230	Introduction to Atmos. Sci.	3	130	
	ATMS 245	Atmos. Observations & Measure.	1	19	
1998/99	ATMS 533	Atmospheric Physics II	3	14	6
	ATMS 638	Atmospheric Radiation	3		3
1999/00	ATMS 533	Atmospheric Physics II	3	2	
	ATMS 230	Survey Atmos. Sci.	3	155	
2000/01	ATMS 545	Atmos. Observ. & Measure. II	2	9	
	ATMS 532	Atmospheric Physics I	3	24	1
2001/02	EAS 535	Atmos. Observ. & Measure. II	2	19	1
	EAS 532	Atmospheric Physics I	3	17	4
2002/03	EAS 532	Atmospheric Physics I	3	13	2
2003/04	EAS 535	Atmos. Observ. & Measure. II	3	10	1
	EAS 532	Atmospheric Physics I	3	15	7
	EAS 591R	Atmos. App. Satellite. Rem. Sensing	2		2
2004/05	EAS 533	Atmospheric Physics II	3		5
	EAS 532	Atmospheric Physics I	3	13	1
	EAS 591C	Aerosols, Clouds and Climate	3		4
2005/06	EAS 225	Science of the Atmosphere	3	37	
	EAS 221	Survey Atmos. Sci.	3	191	

	EAS 532	Atmospheric Physics I	3	15	2
	EAS 221	Survey Atmos. Sci.	3	29	
	EAS 230	Atmospheric Science Lab	1	9	
2006/07	EAS 630	Atmospheric Remote Sensing	3		6
	EAS 532	Atmospheric Physics I	3	12	7
2007/08	EAS 638	Atmospheric Radiation	3		4
	EAS 320	Physics of Climate	3	24	0
	EAS 532	Atmospheric Physics I	3	18	2
	EAS 221Y	Survey Atmos. Sci.	3	10	
2008/09	EAS 63000-001	Atmospheric Remote Sensing	3		3
	EAS 59100-010	Aerosols, Clouds and Climate	3	3	6
	EAS 53200-001	Atmospheric Physics I	3	16	4

STUDENTS:

Graduate Chairman

<u>Name</u>	<u>Degree</u>	<u>Completion Date</u>
Frederick G. Meyer	M.S.	1990
Ouattara Fatogoma	M.S.	1990
Hui Zhi	M.S.	1990
Richard Cullather	M.S.	1993
Kathryn Ginger	M.S.	1993
Steven M. Gollmer	Ph.D.	1994
Surabi Menon	M.S.	1994
John Laird	M.S.	1995
Michael Batey	M.S.	1996
Jaya Ramaprasad	Ph.D.	1998
Jill Zenner	M.S.	1999
Michael Wilson	M.S.	2000
Jui-Yuan Chiu	Ph.D.	2003
Mariya Shcherbyna Petrenko	Ph.D.	current

POST-DOCS and RESEARCH SCIENTISTS:

Robert N. Green, M.S. (Purdue)	1994-2000
Guang Guo, Ph.D. (Utah)	2000-2002
Zheng Qu, Ph.D. (Chicago)	2002-2003

RESEARCH GRANTS AND CONTRACTS:

<u>Project Title</u>	<u>Agency</u>	<u>Duration</u>	<u>Amount</u>
<i>Principal Investigator (sole, unless specified)</i>			
Parameterization of Cloudiness in Climate Models	NASA	1988-1989	\$ 30,831
Role of Global Cloud Climatologies in Validating Numerical Models	NASA	1989-1993	\$241,150
Parameterization of Atmospheric Radiation for Numerical Models	NSF	1989-1994	\$177,277
The Analysis and Parameterization of Cloud and Radiation Fields in NMC Operational Models	NSF	1990-1994	\$161,334
The Analysis and Parameterization of Cloud and Radiation Data for the Study of Cloud-Climate Interactions	NASA	1992-1996	\$281,405

Studies in the Parameterization of Cloudiness and Radiation in the NOGAPS Spectral Forecast Model	NRL	1992-1996	\$242,353
Radiation Parameterization in the NOGAPS Spectral Model	ONR	1994-1997	\$81,900
Implementation of an Improved Model of Radiation and Cloud Overlap in the NOGAPS Model	NRL	1996-1999	\$124,000
The Analysis and Parameterization of Shortwave Radiation in Cloudy Atmospheres	NASA	1996-2001	\$296,000
Quantifying the Indirect Radiative Forcing of Sulfate Aerosols by a Hybrid Technique (Co-PI)	NASA	1998-2001	\$284,508
Upgrade of radiation & cloud parameterizations in the NOGAPS Model	ONR	2001-2004	\$173,816
Assessing the potential of aerosol indirect radiative forcing using model simulations and satellite retrievals	NASA	2004-2008	\$291,655
<i>Co-Investigator</i>			
Installation and Operation of an Experimental Facility for Observing the Flux of Ultraviolet Radiation and its Interaction with the Atmospheric Haze Layer.	Showalter Trust	1992-1993	\$50,000
A fellowship program for computational Earth sciences (1 of 5 Co-Is)	GAANN D. of Edu.	2000-2005	\$416,370
<i>Faculty Advisor</i>			
Wavelet Modeling of Marine Stratocumulus (Steven M. Gollmer and Michael Batey)	NASA Fellowship	1992-1994	\$44,000
The Effect of Anthropogenic Aerosols on Cloud Optical Properties: A Case Study of the Eastern United States (Jaya Ramaprasad and Jill Zenner)	NASA Fellowship	1996-1999	\$66,000
Improving Vertical Profiles of Biomass Burning Emissions Using Satellite Observations and Numerical Modeling (Mariya Shcherbyna Petrenko)	NASA Fellowship	2008-	\$30,000
<i>Editorship</i>			
Editor, Journal of Applied Meteorology	AMS	1996-2001	\$50,770

REFEREED PUBLICATIONS:

Journals

Cess, R.D., and Harshvardhan, 1974. Shear-flow stability within the atmosphere of Venus. *J. Fluid Mech.*, **66**, 267-272.

Harshvardhan, and Cess, R.D., 1976. Stratospheric aerosols: effect upon atmospheric temperature and global climate. *Tellus*, **28**, 1-10.

Harshvardhan, and Cess, R.D., 1978. Effect of tropospheric aerosols upon atmospheric infrared cooling rates. *J. Quant. Spectrosc. Radiat. Transfer*, **19**, 621-632.

Harshvardhan, 1979. Perturbation of the zonal radiation balance by a stratospheric aerosol layer. *J. Atmos. Sci.*, **36**, 1274-1285.

Konyukh, L.A., Yurevich, F.B., Cess, R.D., and Harshvardhan, 1979. Tropospheric aerosols: effect upon the surface and surface-atmosphere radiation budgets. *J. Quant. Spectrosc. Radiat. Transfer*, **22**, 483-488.

- Weinman, J.A., Harshvardhan, and Olson, W. S., 1981. Infrared radiation emerging from smoke produced by brush fires. *Appl. Opt.*, **20**, 199-206.
- Harshvardhan, Weinman, J.A., and Davies, R., 1981. Transport of infrared radiation in cuboidal clouds. *J. Atmos. Sci.*, **38**, 2500-2513.
- Harshvardhan, and Weinman J.A., 1982. Infrared radiative transfer through a regular array of cuboidal clouds. *J. Atmos. Sci.*, **39**, 431-439.
- Harshvardhan, 1982. The effect of brokenness on the cloud-climate sensitivity. *J. Atmos. Sci.*, **39**, 1853-1861.
- Weinman, J.A., and Harshvardhan, 1982. Solar reflection from a regular array of horizontally finite clouds. *Appl. Opt.*, **21**, 2940-2944.
- King, M.D., Harshvardhan, and Arking, A., 1984. A model of the radiative properties of the El Chichon stratospheric aerosol layer. *J. Climate Appl. Meteor.*, **23**, 1121-1137.
- Harshvardhan, and Thomas, R.W.L., 1984. Solar reflection from interacting and shadowing cloud elements. *J. Geophys. Res.*, **89**, 7179-7185.
- Harshvardhan, and Randall, D.A., 1985. Comments on 'The parameterization of radiation for numerical weather prediction and climate models'. *Mon. Wea. Rev.*, **113**, 1832-1833.
- King, M.D., and Harshvardhan, 1986. Comparative accuracy of selected multiple scattering approximations. *J. Atmos. Sci.*, **43**, 784-801.
- Harshvardhan, Davies, R., Randall, D.A., and Corsetti, T.G., 1987. A fast radiation parameterization for atmospheric circulations models. *J. Geophys. Res.*, **92**, 1009-1016.
- Betts, A.K., and Harshvardhan, 1987. Thermodynamic constraint on the cloud liquid water feedback in climate models. *J. Geophys. Res.*, **92**, 8483-8485.
- Platt, C.M.R., and Harshvardhan, 1988. The temperature dependence of cirrus extinction - implications for climate feedback. *J. Geophys. Res.*, **93**, 11051-11058.
- Harshvardhan, Randall, D.A., Corsetti, T.G., and Dazlich, D.A., 1989. Earth radiation budget and cloudiness simulations with a general circulation model. *J. Atmos. Sci.*, **46**, 1922-1942.
- Randall, D.A., Harshvardhan, Dazlich, D.A., and Corsetti, T.G., 1989. Interactions among radiation, convection, and large-scale dynamics in a general circulation model. *J. Atmos. Sci.*, **46**, 1943-1970.
- Harshvardhan, Randall, D.A., and Dazlich, D.A., 1990. Relationship between the longwave cloud radiative forcing at the surface and the top of the atmosphere. *J. Climate*, **3**, 1435-1443.
- Randall, D.A., Harshvardhan, and Dazlich, D.A., 1991. Diurnal variability of the hydrologic cycle in a general circulation model. *J. Atmos. Sci.*, **48**, 40-62.
- Ridgway, W.L., Harshvardhan, and Arking, A., 1991. Computation of atmospheric infrared cooling rates by exact and approximate methods. *J. Geophys. Res.* **96**, 8969-8984.
- Harshvardhan, 1991. Atmospheric radiation. *Rev. Geophys.*, **29**, Supplements, 56-68.
- Harshvardhan, and King, M.D., 1993. Comparative accuracy of diffuse radiative properties computed using selected multiple scattering approximations. *J. Atmos. Sci.*, **50**, 247-259.
- Zhi, H., and Harshvardhan, 1993. A hybrid technique for computing the monthly mean net longwave surface radiation over oceanic areas. *Theor. Appl. Climatol.*, **47**, 65-79.
- Harshvardhan, Wielicki, B.A., and Ginger, K.M., 1994. The interpretation of remotely sensed cloud properties from a model parameterization perspective. *J. Climat.*, **7**, 1987-1998.
- Cahalan, R.F., Ridgway, W., Wiscombe, W.J., Gollmer, S., and Harshvardhan, 1994. Independent pixel and Monte Carlo estimates of stratocumulus albedo. *J. Atmos. Sci.*, **51**, 3776-3790.
- Harshvardhan, and Espinoza, R.C., Jr., 1994. Simple parameterizations of the radiative properties of cloud layers: a review. *Atmos. Res.*, **35**, 113-125.
- Gollmer, S.M., Harshvardhan, Cahalan, R.F., and Snider, J.B., 1995. Windowed and wavelet analysis of marine stratocumulus cloud inhomogeneity. *J. Atmos. Sci.*, **52**, 3013-3030.
- Espinoza, R.C., Jr., and Harshvardhan, 1996. Parameterization of solar near-infrared radiative properties of cloud layers. *J. Atmos. Sci.*, **53**, 1559-1568.

- Cullather, R.I., Harshvardhan, and Campana, K.A., 1997. Climatology of cloud and radiation fields in a numerical weather prediction model. *Theor. Appl. Climatol.*, **57**, 11-33.
- Laird, J.L., and Harshvardhan, 1997. Analysis of cumulus solar irradiance reflectance (CSIR) events. *Atmos. Res.*, **44**, 317-332.
- Harshvardhan, Ridgway, W., Ramaswamy, V., Freidenreich, S.M., and Batey, M., 1998. Spectral characteristics of solar near-infrared absorption in cloudy atmospheres. *J. Geophys. Res.*, **103**, 28, 793-28,799.
- Batey, M., Harshvardhan, and Green, R., 2000: Geometrically effective cloud fraction for solar radiation. *Atmos. Res.*, **55**, 115-129.
- Harshvardhan, Schwartz, S.E., Benkovitz, C.M, and Guo, G., 2002. Aerosol influence on cloud microphysics examined by satellite measurements and chemical transport modeling. *J. Atmos. Sci.*, **59**, 714-725.
- Schwartz, S.E., Harshvardhan, and Benkovitz, C.M., 2002. Influence of anthropogenic aerosol on cloud optical depth and albedo shown by satellite measurements and chemical transport modeling. *Proc. Natl. Acad. Sci.*, **99**, 1784-1789.
- Harshvardhan, Guo, G., Green, R.N., Qu, Z., and Nakajima, T.Y., 2004. Remotely sensed microphysical and thermodynamic properties of non-uniform water cloud fields. *J. Atmos. Sci.*, **61**, 2574-2587.
- Bennartz, R. and Harshvardhan, 2007. Correction to 'Global assessment of marine boundary layer cloud droplet number concentration from satellite' by R. Bennartz. *J. Geophys. Res.*, **112**, D16302, doi:10.1029/2007JD008841.
- Harshvardhan, Zhao, G., Di Girolamo, L., and Green, R.N., 2009. Satellite-observed location of stratocumulus cloud-top heights in the presence of strong inversions. *IEEE Trans. Geosci. Remote Sensing*, **47**, doi: 10.1109/TGRS.2008.2005406 (in press).
- Wilcox, E.M, Harshvardhan, and Platnick, S., 2009: An estimate of the impact of absorbing aerosol over cloud on the MODIS retrievals of cloud optical thickness and effective radius using two independent retrievals of liquid water path. *J. Geophys. Res.*, **114**, doi:10.1029/2008JD010589 (in press).

Book Chapters

- Harshvardhan, Arking, A., King, M.D., and Chou, M-D, 1984. Impact of the El Chichon stratospheric aerosol layer on northern hemisphere temperatures. *Aerosols and their Climatic Effects*, H. Gerber and A. Deepak (eds.), A. Deepak Publishing, 261-273.
- Binenko, V.I, and Harshvardhan, 1991. Vliyanye aerolya na perenos radiatsiyi. *Aerolya i Klimat.*, K.Ya. Kondratyev (ed.), Leningrad Gidrometeoizdat, 427-487.
- Harshvardhan, 1992. The computation of radiative fluxes and heating rates in high resolution atmospheric numerical models. *Physical Processes in Atmospheric Models*. D.R. Sikka and S.S. Singh (eds.), Wiley Eastern Limited, New Delhi, 261-279.
- Binenko, V.I., and Harshvardhan, 1993. Aerosol effects in radiation transfer. *Aerosol Effects on Climate*, S.G. Jennings (ed.), University of Arizona Press, 190-232.
- Harshvardhan, 1993. Aerosol-Climate Interactions. *Aerosol-Cloud-Climate Interactions*, P.V. Hobbs (ed.), Academic Press, 75-95.

OTHER PUBLICATIONS:

- Harshvardhan, and Cess, R.D., 1975. Stratospheric aerosols: effect upon atmospheric temperature and global climate. Collection of Abstracts, Second Conference on Atmospheric Radiation, Arlington, VA, 135-137.
- Harshvardhan, 1976. Effect of aerosols on radiative transfer in the Earth's atmosphere. Ph.D. dissertation, State University of New York, Stony Brook, New York.
- Harshvardhan, and Cess, R.D., 1978. Effect of tropospheric aerosols upon atmospheric infrared cooling rates. Preprints, Third Conference on Atmospheric Radiation, Davis, CA, 308-311.
- Harshvardhan, 1978. Albedo enhancement and perturbation of radiation balance due to stratospheric aerosols. NASA Technical Memorandum 79573, Goddard Space Flight Center, Greenbelt, MD. 54 pp.

- Harshvardhan, Weinman, J.A., and Davies, R., 1980. Infrared emission from broken clouds. Extended abstracts, International Radiation Symposium, Ft. Collins, CO, 494-496.
- Harshvardhan, Weinman, J.A., and Olson, W.S., 1980. 11.5 micron emission from smokes computed using finite cloud geometry. Proceedings of the ASME Winter Annual Meeting, Chicago, IL. Paper 80-WA-HT-1.
- Harshvardhan, and Corsetti, T.G., 1984. Longwave radiation parameterization for the UCLA/GLAS GCM. NASA Technical Memorandum 86072, Goddard Space Flight Center, Greenbelt, MD. 51 pp.
- Randall, D.A., and Harshvardhan, 1985. Analysis and verification of a simulated cloud climatology. Extended abstracts, Third Conference on Climate Variations and Symposium on Contemporary Climate, 1850-2100, Los Angeles, CA, 114-115.
- Randall, D.A., and Harshvardhan, 1986. Cloud radiative forcing in a general circulation model. Preprints, Sixth Conference on Atmospheric Radiation, Williamsburg, VA, 31-34.
- Harshvardhan, and Randall, D.A., 1986. Cloud and radiation experiments with a general circulation model. Preprints, Sixth Conference on Atmospheric Radiation, Williamsburg, VA, 44-47.
- King, M.D., and Harshvardhan, 1986. Comparative accuracy of the albedo, transmission and absorption for selected radiative transfer approximations. NASA RP-1160, 41 pp.
- Harshvardhan, 1986. Radiation flux tables for ICRCCM using the GLA GCM radiation codes. NASA X-613-86-10.
- Harshvardhan, 1989. Relationship between the longwave cloud radiative forcing at the surface and the top of the atmosphere. Extended abstracts, FIRE Science Meeting, Monterey, CA, 247-251.
- Harshvardhan, and Zhi, H, 1990. Cloud forcing and the net longwave surface radiation. Preprints, Seventh Conference on Atmospheric Radiation, San Francisco, CA, 247-250.
- Ridgway, W.L., and Harshvardhan, 1990. Computation of atmospheric infrared cooling rates by exact and approximate methods. Preprints, Seventh Conference on Atmospheric Radiation, San Francisco, CA, 385-388.
- Gollmer, S.M., Harshvardhan, Cahalan, R.F., and Snider, J.B., 1992. Wavelet analysis of marine stratocumulus. Proceedings 11th International Conference on Clouds and Precipitation, Montreal, Canada, 827-830.
- Cullather, R.I., Harshvardhan, and Campana, K.A., 1994. An analysis of the cloud and radiation fields generated by the NMC global model. Preprints, Eighth Conference on Atmospheric Radiation, Boston, MA, 38-40.
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