Dr. Robert Buras

Publikationen und Lehre

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Publikationen

1. Kostka, P. M., M. Weissmann, **R. Buras**, B. Mayer und O. Stiller (submitted). Observation Operator for Visible and Near-Infrared Satellite Reflectances. *J. Appl. Meteorol. Clim.*
2. Wissmeier, U., **R. Buras** und B. Mayer (2013). paNTICA: A fast 3D radiative transfer scheme to calculate surface solar irradiance for NWP and LES models. *J. Appl. Meteorol. Clim.* **52**, 1698–1715.
3. Wilbert, S., B. Reinhardt, J. DeVore, M. Röger, R. Pitz-Paal, C. Gueymard und **R. Buras** (2013). Measurement of solar radiance profiles with the Sun and Aureole Measurement system (SAM). *J. Sol. Energy Engineer.* **135**(4), 041002.
4. Kylling, A., **R. Buras**, S. Eckhardt, C. Emde, B. Mayer und A. Stohl (2013). Simulation of SEVIRI infrared channels: a case study from the Eyjafjallajökull April–May 2010 eruption. *Atm. Meas. Techn.* **6**, 649–660.
5. **Buras, R.**, T. Dowling und C. Emde (2011). New secondary-scattering correction in DISORT with increased efficiency for forward scattering. *J. Quant. Spectrosc. Radiat. Transfer* **112**(12), 2028–2034.
6. **Buras, R.** und B. Mayer (2011). Efficient unbiased variance reduction techniques for Monte Carlo simulations of radiative transfer in cloudy atmospheres: The solution. *J. Quant. Spectrosc. Radiat. Transfer* **112**(3), 434–447.
7. Emde, C., **R. Buras** und B. Mayer (2011). ALIS: An efficient method to compute high spectral resolution polarized solar radiances using the Monte Carlo approach. *J. Quant. Spectrosc. Radiat. Transfer* **112**(10), 1622–1631.
8. Emde, C., **R. Buras**, B. Mayer und M. Blumthaler (2010). The impact of aerosols on polarized sky radiance: Model development, validation, and applications. *Atmos. Chem. Phys.* **10**(2), 383–396.
9. Janka, H.-T., B. Mueller, F. Kitaura und **R. Buras** (2008). Dynamics of shock propagation and nucleosynthesis conditions in O-Ne-Mg core supernovae. *Astron. Astrophys.* **485**(1), 199–208.
10. **Buras, R.**, M. Rampp, H.-T. Janka und K. Kifonidis (2006). Two-dimensional hydrodynamic core-collapse supernova simulations with spectral neutrino transport. 1. Numerical method and results for a 15 solar mass star. *Astron. Astrophys.* **447**(3), 1049–1092.
11. **Buras, R.**, H.-T. Janka, M. Rampp und K. Kifonidis (2006). Two-dimensional hydrodynamic core-collapse supernova simulations with spectral neutrino transport. 2. models for different progenitor stars. *Astron. Astrophys.* **457**(1), 281–308.
12. Marek, A., H. Dimmelmeier, H.-T. Janka, E. Muller und **R. Buras** (2006). Exploring the relativistic regime with Newtonian hydrodynamics: An Improved effective gravitational potential for supernova simulations. *Astron. Astrophys.* **445**(1), 273–289.
13. Pruet, J., R. Hoffman, S. Woosley, H.-T. Janka und **R. Buras** (2006). Nucleosynthesis in early supernova winds. 2. the role of neutrinos. *Astrophys.J.* **644**(2), 1028–1039.
14. Kachelriess, M., R. Tomas, **R. Buras**, H.-T. Janka, A. Marek und M. Rampp (2005). Exploiting the neutronization burst of a galactic supernova. *Phys.Rev.* **D71**, 063003.

15. Marek, A., H.-T. Janka, **R. Buras**, M. Liebendoerfer und M. Rampp (2005). On ion-ion correlation effects during stellar core collapse. *Astron.Astrophys.* **443**, 201–210.
16. Pruet, J., S. Woosley, **R. Buras**, H.-T. Janka und R. Hoffman (2005). Nucleosynthesis in the hot convective bubble in core-collapse supernovae. *Astrophys.J.* **623**(1), 325–336.
17. Mueller, E., M. Rampp, **R. Buras**, H.-T. Janka und D. H. Shoemaker (2004). Towards gravitational wave signals from realistic core collapse supernova models. *Astrophys.J.* **603**(1), 221–230.
18. **Buras, R.**, H.-T. Janka, M. T. Keil, G. G. Raffelt und M. Rampp (2003). Electron neutrino pair annihilation: A new source for muon and tau neutrinos in supernovae. *Astrophys.J.* **587**(1), 320–326.
19. **Buras, R.**, M. Rampp, H. T. Janka und K. Kifonidis (2003). Improved models of stellar core collapse and still no explosions: What is missing? *Phys.Rev.Lett.* **90**, 241101.
20. Janka, H., **R. Buras** und M. Rampp (2003). The mechanism of core-collapse supernovae and the ejection of heavy elements. *Nucl.Phys.* **A718**, 269–276.
21. **Buras, R.** und D. Semikoz (2002). Lepton asymmetry creation in the early universe. *Astropart.Phys.* **17**, 245–261.
22. Buras, A. und **R. Buras** (2001). A Lower bound on $\sin 2$ beta from minimal flavor violation. *Phys.Lett.* **B501**, 223–230.
23. **Buras, R.** und D. Semikoz (2001). Maximum lepton asymmetry from active sterile neutrino oscillations in the early universe. *Phys.Rev.* **D64**, 017302.

Konferenzbeiträge

24. **Buras, R.** und J. Gasteiger (2012, submitted). ARLEM: A Monte-Carlo-based retrieval algorithm for wide FOV lidar systems. *International Laser Radar Conference 26*.
25. Sauer, D., J. Gasteiger, C. Emde, **Buras, R.**, B. Mayer und B. Weinzierl (2012). The visibility of airborne volcanic ash from the flight deck of an aircraft - The effect of clouds in the field of view. *AIP Conf.Proc.* **1531**, 63–66.
26. Pause, C., **R. Buras**, C. Emde und B. Mayer (2012). The Simulation Of Radar And Coherent Backscattering With The Monte-Carlo Model MYSTIC. *AIP Conf.Proc.* **1531**, 59–62.
27. Filipitsch, F., **R. Buras** und M. Fuchs (2012). Model Studies on the Retrieval of Aerosol Properties beneath Cirrus Clouds for a Spaceborne HSRL. *AIP Conf.Proc.* **1531**, 452–455.
28. Reinhardt, B., **R. Buras**, B. Mayer und L. Bugliaro (2011). Circumsolarstrahlung aus MSG-Beobachtungen für CSP/CPV-Planung und -Monitoring. *2. Fachtagung Energiemeteorologie*.
29. Bugliaro, L., F. Faure, **R. Buras**, T. Zinner und B. Mayer (2011). Realistic Simulations of MSG/SEVIRI Scenes for Cloud Algorithm Validation. *Cloud Retrieval Evaluation Workshop 3*.
30. Petzold, A., M. Esselborn, B. Weinzierl u. a. (2010). ICAROHS - Inter-Comparison of Aerosol Retrievals and Observational Requirements for Multi-wavelength HSRL Systems. *International Aerosol Conference*.
31. Faure, F., **R. Buras**, T. Zinner, B. Mayer und L. Bugliaro (2010). Validation of the MSG SEVIRI retrieved cloud properties using 3D radiative transfer simulations. *EUMETSAT Meteorological Satellite Conference*.
32. Faure, F., **R. Buras**, T. Zinner, B. Mayer und L. Bugliaro (2009). Radiative transfer simulations for the validation of cloud products from MSG. *EUMETSAT Meteorological Satellite Conference*.
33. Hoffman, R., J. Fisker, J. Pruet, S. Woosley, H.-T. Janka und **R. Buras** (2008). Nucleosynthesis in Early Neutrino Driven Winds. *AIP Conf.Proc.* **1005**, 225–228.
34. Kifonidis, K., **R. Buras**, A. Marek und H.-T. Janka (2006). Toward TFlop simulations of supernovae. *High Perf. Computing on Vector Systems*, 197–212.
35. Martinez-Pinedo, G., A. Kelic, K. Langanke, K.-H. Schmidt, D. Mocelj u. a. (2006). Nucleosynthesis in neutrino heated matter: The vp-process and the r-process. *PoS* **NIC-IX**, 064.

36. Janka, H.-T., **R. Buras**, F. Kitaura Joyanes, A. Marek, M. Rampp und L. Scheck (2005). Neutrino-driven supernovae: An Accretion instability in a nuclear physics controlled environment. *Nucl.Phys.* **A758**, 19–26.
37. Janka, H.-T., **R. Buras**, K. Kifonidis, A. Marek und M. Rampp (2005). Core-collapse supernovae at the threshold. *Cosmic Explosions. Springer Procs. in Physics.* **99**(IV), 253–262.
38. Janka, H. T., **R. Buras**, F. Kitaura Joyanes, A. Marek und M. Rampp (2004). Core-collapse supernovae: modeling between pragmatism and perfectionism. *Procs. 12th Workshop on Nuclear Astrophysics, Ringberg Castle, March 22-27, 2004*.
39. Raffelt, G. G., M. T. Keil, **R. Buras**, H.-T. Janka und M. Rampp (2003). Supernova neutrinos: Flavor-dependent fluxes and spectra. *The Fourth International Workshop on Neutrino Oscillations and Their Origin*, 380–387.
40. Janka, H.-T., **R. Buras**, K. Kifonidis, T. Plewa und M. Rampp (2003). Core collapse and then? The route to massive star explosions. *From Twilight to Highlight: The Physics of Supernovae. ESO Astrophysics Symposia*, 39–52.
41. Janka, H. T., **R. Buras**, K. Kifonidis, M. Rampp und T. Plewa (2004). Explosion mechanisms of massive stars: A Critical review of possibilities and perspectives. *Stellar Collapse, edited by C. Fryer*, 65–97.
42. Rampp, M., **R. Buras**, H. T. Janka und G. Raffelt (2002). Core-collapse supernova simulations: variations of the input physics. *Nuclear Astrophysics, edited by W. Hillebrandt & E. Muller*, 119–125.

Projekte

proxyFCI **Generation of simulated proxy data for the Meteosat Third Generation Flexible Combined Imager**, *Co-antragsteller*, seit Herbst 2012.

HD(CP)^2 **High definition clouds and precipitation for advancing climate prediction**, *Co-antragsteller von Teilprojekten M7 und O3*, seit Herbst 2012.

ESASLight II **Generic Radiative Transfer Model for the Earth's Surface-Atmosphere System ESAS-Light II: Towards a community tool**, *Co-Antragsteller, Teilprojektleiter*, seit 2011.

HErZ **Hans-Ertel-Zentrum für Wetterforschung, Fachbereich Datenassimilation**, *Co-leiter*, seit 2010.

DWD Extramurales Projekt **Entwicklung und Validierung einer neuen Strahlungsparametrisierung für COSMO**, *Antragsteller, Projektleiter*, 2009-2013.

SFERA **Solar Facilities for the European Research Area, WP13, Task 1E: Determination of the Sunshape from Meteosat Second Generation**, *Co-leiter*, 2009–2012.

ICAROHS **Inter-Comparison of Aerosol Retrievals and Observational Requirements for Multi-wavelength HSRL Systems**, *Co-antragsteller, Betreuung*, 2008–2010.

SFB375 **Sonderforschungsbereich 375 der DFG: Astro-Teilchenphysik**, *Doktorand/Mitarbeiter*, 2002–2005.

Konferenzen, Workshops, und Seminarvorträge

19-21.2.2013 **Workshop on Monte Carlo Methods in Natural Sciences, Engineering and Economy**, *Hamburg*, Eingeladener Vortrag.

6-10.8.2012 **International Radiation Symposium (IRS)**, *Berlin*, Vortrag, "ARLEM: A Monte-Carlo-based retrieval algorithm for wide FOV and other future lidar systems".

25-29.6.2012 **26th International Laser Radar Conference (ILRC)**, *Porto Heli, Griechenland*, Vortrag, "ARLEM: A Monte-Carlo-based retrieval algorithm for wide FOV and other future lidar systems".

10-15.7.2011 **Gordon Research Conference (GRC) on Radiation and Climate**, *Colby College, Waterville, Maine, USA*, Poster, "Where no photon has gone before. . . state-of-the-art 3D radiative transfer with MYSTIC".

19-29.7.2009 **International Association of Meteorology and Atmospheric Sciences (IAMAS) General Assembly**, *Montreal, Kanada*, Vortrag, "How to make a Monte Carlo code fast without biasing".

19-24.4.2009 **European Geosciences Union (EGU) General Assembly**, *Wien, Österreich*, Poster, "Applications of a fast Monte Carlo model for Lidar simulations".

20-22.1.2009 **1. Fachtagung Energiemeteorologie**, *Grainau*, Vortrag, "Entwicklung von Solarstrahlungsvorhersagen für das COSMO-Modell".

16.2.2009 **Seminar am Institut für Physik der Atmosphäre (IPA), DLR**, *Oberpfaffenhofen*, Vortrag, "Lidar und Vielfachstreuung: Schnelle Monte-Carlo-Simulationen in Wasser- und Eiswolken".

22-27.3.2004 **12th Workshop on Nuclear Astrophysics**, *Schloß Ringberg, Tegernsee*, Vortrag.

2002 **Kolloquiumsvortrag am Max-Planck-Institut für Physik**, *München*, Eingeladener Vortrag, "Core Collapse Supernovae".

25-30.5.2002 **XXth International Conference on Neutrino Physics and Astrophysics**, *München*.

18.6.-24.8.2001 **Workshop am Institute for Nuclear Theory Seattle: Neutron Stars**, *Seattle, Washington, USA*.

5-15.9.2000 **32. Herbstschule für Hochenergiephysik**, *Maria Laach*, Vortrag, "Sterile Neutrinos im Frühen Universum".

11-15.10.1999 **6. SFB-375 Ringberg Workshop Astroteilchenphysik**, *Schloß Ringberg, Tegernsee*, Vortrag, "Sterile Neutrinos in Big Bang Nucleosynthesis".

Studentenbetreuung

Doktorarbeiten

C. Pause **Development of a Monte-Carlo radar simulator with coherent backscattering**, *seit Dezember 2010*.

P. Frerebeau **Development of a fast satellite image simulator for solar radiation for NWP models**, *seit April 2010*.

B. Reinhardt **Determination of the sunshape in the presence of Cirrus from Meteosat Second Generation**, *seit April 2010*.

A. Marek **Multi-dimensional simulations of core collapse supernovae with different equations of state for hot proto-neutron stars**, *2003–2005*.

Diplom-/Masterarbeiten

F. Jakub — **Parametrization of 3D radiative transfer effects on solar heating rates in NWP models using Cascaded Uniform Filters on Decomposed Flux Fields**, *2013*.

F. Filipitsch — **Simulationen zur Datenrückgewinnung von Aerosoleigenschaften aus Schichten unter dünner Cirrus-Bewölkung für satellitengetragene Lidar-Messungen**, *2010*.

M. Fuchs — **Quantification of multiple scattering effects on space borne lidar retrieval**, *2010*.

A. Marek — **The effects of the nuclear equation of state on stellar core collapse and supernova evolution**, *2003*.

F.-S. Kitaura — **Hydrodynamical simulation of the stellar collapse of O/Ne/Mg cores with Boltzmann neutrino transport**, *2003*.

Bachelorarbeiten

S. Bloch — **Optimierung der Blickrichtung eines Polarisations-Lidar-Systems bei Tageslicht mit Monte-Carlo-Simulationen**, *2012*.

B. Marx — **3D-Simulationen von Blitzsatellitenmessungen**, *2012*.

T. Sirch — **Validierung von Bauernregeln basierend auf Wetteraufzeichnungen: "Kommt der Frost im Jänner nicht, zeigt er im März dir sein wahr Gesicht"**, *2010*.

Vorlesungen

SS 2013, SS 2012, SS 2011, SS 2010 — **Fernerkundung**, *Bachelor Physik+Meteorologie LMU, 4. Semester*.

WS 2011/2, WS 2010/1 — **Monte-Carlo-Blockpraktikum**, *Master ESPACE, TUM, 2. Semester*.

SS 2011, SS 2010, SS 2009 — **Übung Physik der Atmosphäre**, *Bachelor Physik+Meteorologie LMU, 6. Semester*.

WS 2012/13, WS 2011/12, WS 2010/11, WS 2009/10 — **Übung Fortgeschrittene Physik der Atmosphäre**, *Master Meteorologie LMU, 1. Semester*.