

Dr. Thomas Hams

Present Position: CRESST/USRA, Research Scientist, Astrophysics Science Division
Astroparticle Physics Laboratory
NASA/GSFC

Education: Ph.D., Physics, Universität Siegen, Germany, 2002
Dipl.-Phys., Universität Siegen, Germany, 1996
Electronics Engineering Technician Apprenticeship at Theo Benning,
Bocholt, Germany, 1990

Awards: NRC Research Associateship, 2002
Goddard/LHEA Peer-Award, 2004

Relevant Experience:

After earning his the physics degree (1996) from the University of Siegen in Germany, Mr. Hams worked in their experimental Astrophysics group led by Prof. Dr. Manfred Simon. There he got involved with the ISOMAX experiment, a balloon-borne superconducting magnetic-rigidity spectrometer. Mr. Hams was responsible for the drift chamber tracking detector of the spectrometer and he supported two ISOMAX balloon campaigns. The scientific objective of the ISOMAX experiment is to precisely measure the isotopic composition of light elements ($2 < Z < 9$) in the galactic cosmic radiation (GCR) and, in particular, to determine the relative abundance of the radioactive clock-isotope ^{10}Be to its stable neighbor ^9Be . The ratio of stable secondary to primary cosmic rays can address the amount of matter that cosmic-rays have traversed during their propagation through the galaxy. By measuring the abundance of radioactive secondaries, one can constrain the confinement time of GCR in the galaxy and thus infer the density of the interstellar medium. This work on ISOMAX experiment and data analysis was the topic of Mr. Hams Ph.D. thesis. He received he degree in early 2002. The same year, Dr. Hams was awarded an NRC Associateship at Goddard Space Flight Center (GSFC/NASA), where he got involved in the BESS-Polar instrument, a US-Japanese balloon-borne experiment searching for antimatter in the cosmic-radiation. Dr. Hams' contributions to BESS-Polar include the design, fabrication, and testing of the aerogel Cherenkov counter as well as analysis of the data of the BESS-Polar 2004 flight. In 2005, Dr. Hams joined USRA as a Research Scientist. For the second BESS-Polar flight conducted in late 2007, Dr. Hams was responsible for the design, fabrication, and calibration of the outer Time-of-Flight detector. He is currently working BESS-Polar II data analysis. In addition, Dr. Hams is involved in a number of other cosmic ray research programs.

Research Interests:

BESS-Polar: Balloon-borne Experiment with a Superconducting Spectrometer. Co-I
Searching for Evidence of Dark Matter in the Cosmic Radiation, Co-I
Dr. Hams is also involved in OASIS.

Publications: (selection of reviewed papers)

Yamamoto, A. et al. 2007, J. Adv. Space Res.(in press), "Search for primordial antiparticles with BESS", (doi:10.1016/j.asr.2007.04.069).

Yoshimura, K. et al. 2007, J. Adv. Space Res. (in press), "BESS-Polar Experiment: Progress and Future Prospects".

Sasaki, M. et al. 2007, J. Adv. Space Res. (in press), "Search for Antihelium: Progress with BESS"

Shikaze, Y. et al. 2007, *Astroparticle Physics*, 28, 154-167 "Measurements of 0.2 to 20 GeV/n cosmic-ray proton and helium spectra from 1997 through 2002 with the BESS spectrometer", (astro-ph/0611388).

Mitchell, J.W. et al. 2005, *Advances in Space Research* 35 (2005) 135–141, "Precise measurements of the cosmic ray antiproton spectrum with BESS including the effects of solar modulation"

Yoshida, T. et al. 2004, *Advances in Space Research* 33 1755–1762, "BESS-polar experiment"

Hams, T. et al., 2004, *Astrophysical Journal*, 611, 892, "Measurement of the Abundance of Radioactive ^{10}Be and Other Light Isotopes in Cosmic Radiation up to 2 GeV Nucleon-1 with the Balloon-borne Instrument ISOMAX"

Haino, S. et al. 2004, *Nucl. Inst. Meth. A* 518, 167–171, "Progress of the BESS Superconducting Spectrometer"