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The Sulfur, Argon, and Calcium Isotopic Composition of the Galactic Cosmic Ray Source

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Abstract content

We have determined the cosmic ray source abundances of the isotopes of sulfur, argon, and calcium using data from the Cosmic Ray Isotope Spectrometer (CRIS) aboard the ACE spacecraft. We compare the source abundances derived in this work, employing a leaky-box model, with those calculated using the GALPROP cosmic ray propagation code. Cosmic rays are thought to originate in the cores of superbubbles which contain stellar ejecta mixed with the surrounding interstellar medium. Based on the derived isotopic source ratios of sulfur, argon, and calcium, the superbubble material at the cosmic ray source is constrained to be 18%(-14%)(+26%) supernova and wind ejecta, with the remainder interstellar medium material. This mix of metal-rich ejecta and interstellar matter in the superbubble core corresponds to a cosmic ray source metallicity of 2.7(-2.1)(+3.9) times solar metallicity.

If this papers is presented for a collaboration, please specify the collaboration

Summary

Reference

Proceedings of the 30th International Cosmic Ray Conference; Rogelio Caballero, Juan Carlos D'Olivo, Gustavo Medina-Tanco, Lukas Nellen, Federico A. Sánchez, José F. Valdés-Galicia (eds.); Universidad Nacional Autónoma de México, Mexico City, Mexico, 2008; Vol. 2 (OG part 1), pages 125-128

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