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Studying the constancy of galactic cosmic rays using noble gas and radionuclides data on iron meteorites

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The constancy of the galactic cosmic rays (GCR) is a long-standing question in meteorite research. Temporal variations in the GCR intensity might not only shed light into the origin and evolution of the cosmic rays, it will also compromise systematic studies of the dynamics of small bodies in the solar system using exposure age histograms. Here we present the first results of our study to set-up a consistent exposure ages histogram for iron meteorites, which enables to search for periodic GCR variations. So far, the light noble gases He, Ne, Ar and the cosmogenic radionuclides ^{10}Be , ^{26}Al , and ^{36}Cl have been measured, respectively by mass spectrometry in Bern and at the DREAMS facility [1], in 22 iron meteorites, mostly from group IIIAB. Though, some of the data are still preliminary and further data for ^{41}Ca , ^{53}Mn , and ^{60}Fe are awaited, these data will provide some new information about the distribution of exposure ages among iron meteorites and therefore also on the temporal variability of the GCR.

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[1] Akhmadaliev, S. et al. (2012) NIMB 294, 5–10.

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