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Pre-irradiation effects of chondrules from CR2 chondrite El Djouf 001.

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Pre-irradiation effects of chondrules are indicated by higher concentration of cosmogenic noble gases in chondrules compared to the bulk meteorite. Previous studies have shown occasional evidence for solar pre-irradiation [1-5]. Here, we present data for primitive CR2 chondrite El Djouf 001 chondrules and matrix. Elemental compositions were determined using INAA on the same material used for noble gas measurements (He, Ne, Ar).

“Nominal” cosmic ray exposure ages (without shielding correction, e.g. $(^{22}\text{Ne}/^{21}\text{Ne})_c = 1.11$) of all El Djouf 001 chondrules are elevated compared to the matrix (by up to 1.7 Ma), strongly pointing towards a pre-irradiation of chondrules. Abundant solar wind (SW) gases in may indicate that this pre-irradiation took place on the parent body. We will continue our search for pre-irradiation effects of chondrules that do not show evidence for implanted SW. Noble gas measurements including two primitive CR3s are in progress.

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Cite abstract as:

Beyersdorf-Kuis, U., Trieloff, M., Cartwright, J.A., Bennett, J.W., et al. (2012) Pre-irradiation effects of chondrules from CR2 chondrite El Djouf 001.. Paneth Kolloquium, Nördlingen (Germany), abstract URL: <http://www.paneth.eu/PanethKolloquium/2012/0169.pdf> (abstract #0169).