Abstract IMA

**The lorandite experiment (LOREX): Lorandite age and erosion rates at Allchar ore deposit.**

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LOREX, the acronym for LORandite EXperiment, attempts the determination of the solar neutrino flux by measuring the 205Pb content in the thallium-bearing mineral lorandite, TlAsS2, from the mine of Allchar, FYR Macedonia, which is there formed via the neutrino-capture reaction 205Tl + νe → 205Pb + e-. This geochemical detector offers the lowest threshold among all the detectors of only 52 keV for solar pp-neutrinos. The final step of LOREX, which is now under way, is the extraction of lorandite, while the ensuing quantitative determination of the ratio of 205Pb / 205Tl atoms would provide the product of solar neutrino flux and neutrino-capture cross section, integrated over the age of lorandite of 4.31 106 yr. The cosmogenic 205Pb produced by fast muons, which constitutes the main component of background, is strongly depth-dependent and very sensitive to the long-term erosion history of the field area. It is estimated that, depending on paleo-depth, 10kg of lorandite contains about (3.5 –11.6) x 105 atoms of 205Pb. This report presents new data on accurate geological age of the minerals at Allchar, as well as the recent results for erosion rates at two lorandite rich locations. These are based on accelerator mass spectrometry determination of 10Be and 26Al in characteristic samples as well as on the independent geo-morphological studies. Provided that thus determined high values of erosion rates are corroborated by remaining measurements of additional samples, the experiment is expected to reach an acceptable signal-to-background ratio.