F-KTP14 : Erstmalige Messung der Coulombexplosion von pionischem Kohlenstoff

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Coulombexplosion bezeichnet das rasche Aufbrechen der Bindung von Molekülen nach deren starker Ionisation. Dabei werden die beiden Fragmente in jeweils entgegengesetzte Richtungen stark beschleunigt. Die Hervorrufung dieses Effekts während der Kaskade in pionischen Kohlenstoff wurde nun im Rahmen des Experiments zu pionischen Wasserstoff am PSI (R-98.01) zum ersten Mal gemessen. Hier macht er sich über eine Dopplerverbreiterung der gemessenen Röntgenlinien bemerkbar und setzt daher die Genauigkeit der Bestimmung ihrer Energie herab. Die Kenntnis der Grösse der Coulombexplosion ist ein guter Test der Auflösung der stark verbesserten experimentellen Apparatur und für die angestrebte Genauigkeit der Messung der Verschiebung und Verbreiterung des 1s Niveaus von pionischem Wasserstoff unabdingbar.

F-KTP15 : ^{182}Hf, an extinct radionuclide of the early solar system and a possibly live supernova remnant on Earth

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The neutron-rich isotope ^{182}Hf has a half-life of 9 ± 2 million years. It can be used to study the early development of the Earth and the Moon through isotopic anomalies of its stable decay product ^{182}W. The system ^{182}Hf - ^{182}W forms a geochronometer, which offers an excellent way to determine the time-scale for the early Solar System's accretion and the core formation of the planets. Many applications in the last few years yielded impressive results, e.g. concerning the origin of the Moon [2]. However, the half-life of ^{182}Hf was measured 40 years ago [1], and a reduction of the large uncertainty would be very desirable. We are engaged in a re-measurement of the half-life, and the current status of this effort will be reported.

^{182}Hf may also complement a few other radionuclides in the million-year half-life range to trace relatively recent stellar events with high neutron fluxes in the vicinity of the Earth. This may be accomplished by finding measurable traces of live ^{182}Hf in suitable terrestrial archives. Since ^{182}Hf has no significant natural sources on earth, live ^{182}Hf is an ideal indicator of a recent, nearby supernova or other explosive stellar events [3]. The AMS detection method of ^{182}Hf with the upgraded VERA facility, and first results of this new AMS nuclide will be presented.

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