Are Dark Matter WIMP’s of Mass 8.6 GeV

Octoneutrons?

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Abstract

Recent experimental findings suggest that WIMP’s at 8.6 GeV are boundstates of 8 neutrons.

PACS: 98.80. Jk – Mathematical and relativistic aspects of cosmology, 98.90. +s – Galactic and extragalactic objects and systems

Dark matter WIMP’s may have been detected recently by Cabrera’s group at Stanford¹, with detector readings around 8.6 GeV. The detector readings showed a 3σ signal consistently during a 14-month run.

Meanwhile, Dudkin’s group at Tomsk² have detected octoneutrons ___ ___ neutron clusters consisting of eight neutrons ___ ___ in the decay of 252Cf nuclei to the daughter nucleus U-232 (half-life of 68.9 years). Since a neutron contributes an average 1.07 GeV to heavier-element nuclei, octoneutrons should have a mass of about $8 \times (1.07 \text{ GeV}) = 8.56 \text{ GeV}$. This suggests that Cabrera’s WIMP’s may be Dudkin’s octoneutrons.

A perfect cubic configuration is the natural presumed structure for an octoneutron, with each neutron essentially abutting its 3 nearest neighbors. Each of the 8 neutrons resides at a vertex of a perfect cube, with gluonic exchange forces acting to
produce strong binding of the neutrons. Such an ultra-tight bound structure would be extremely stable over the age of the Universe. Moreover, with gluonic exchange concentrated at the 8 vertices, the octoneutrons would be ultra-small in size and interact weakly with other matter. Hence, the octoneutron is an extremely logical WIMP candidate.

Acknowledgements. The author would like to thank anonymous reviewers for perspicacious comments. Ms. Sampson provided extremely valuable assistance in the preparation of the manuscript.

References


Received: September 1, 2014