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Review of the Decay Rate Parameter Variation due to Neutrino/Antineutrino Interactions SHIH-CHIEH LIU, DAVID KOLTICK, Purdue Univ, JONATHAN NISTOR, JORDAN HEIM, TechSource Inc. — The stability of the nuclear decay rate parameters have been investigated for many years. For example, the ^{7}Be electron capture decay rate is affected by the electron density or low-temperature. Unexplained variations of the decay rate parameter measurement for weak interaction decays, as well as strong interaction decays, have been reported. Because the variation of the decay rate parameters have been presented by a number groups, located at various locations, using various types of detectors, different isotopes, and over extended periods of time, the nature of the variation has been questioned as not arising from ambient environmental factors but via a fundamental interaction. In this review, all the reported variations are interpreted as involving weak interaction decays and are placed into a framework as being caused by a neutrino(ν) or antineutrino($\bar{\nu}$) flux. For nuclear states with long lifetime compared to the experimental observation time, the reaction cross section is given. The resulting cross sections to alter the decay rate parameter are estimated assuming that the variations are caused by a change in the solar neutrino flux or in the case of nuclear reactor results in the difference between the reactor-on/off antineutrino flux.

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