

Recommended Values of Nuclear Moments – the need for improved calculation involving multi-electron -system computation.

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It is important that the best values of the properties of nuclear states, both stable and radioactive, be available for use in an ever widening range of applications. The speaker is a nuclear experimentalist who chairs an IAEA committee charged with preparing recommended values of all measured magnetic dipole and electric quadrupole moments of nuclear ground and excited states. This involves review of all measurements and, where necessary, bringing input parameters, such as hyperfine fields and electric field gradients, and the various corrections, up to date.

The talk will briefly describe the published electric quadrupole table [1] and its pending update before turning to the situation with magnetic dipole moments. The most precise measurements are of ratios of moments, usually involving an NMR technique. Extraction of individual moments requires correction for diamagnetism (chemical shift) and sometimes also the conduction electron Knight shift. The state of such corrections in various gaseous, liquid and solid systems will be described with a view to encouraging efforts to improve them using modern computation methods.

Problems arising in other areas of magnetic moment measurements will be described if time allows.

[1] N.J.Stone, Atomic Data and Nuclear Data Tables 111-112, 1 (2016)