

Abstracts

The electronic kilogram

M.H. Kelley. "The electronic kilogram." 2001 MTT-S International Microwave Symposium Digest 01.2 (2001 Vol. II [MWSYM]): 857-860 vol.2.

The kilogram is the only remaining base unit in the International System of Units (SI) whose definition is based on a single physical artifact rather than on fundamental properties of nature. Effects such as environmental contamination or material loss from surface cleaning are causing the "true" mass of the International Prototype Kilogram to drift (by about $0.5 \mu\text{g}$ per year), relative to sister prototypes. The equivalence of electrical and mechanical power provides a possible alternate measurement of mass in terms of other units that are based on fundamental quantum mechanical principles, such as the speed of light, the Josephson voltage, and the quantum Hall resistance. This provides a possible time-invariant definition of mass.

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