

## The Magnetic Moment Problem

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Linear momentum of the electron in hydrogen:

$$p = m_e v = m_e \frac{c}{137} = 1.9935 \times 10^{-24} \text{ kg.m / s}$$

True magnetic moment ( units: Weber.meter ):

$$M = q_m x_e = \frac{h}{2q_e} x_e = 5.02 \times 10^{-27} \text{ Wm}$$

Usual magnetic moment or only linear momentum:

$$\mu = \frac{q_e c x_e}{4\pi} = 9.27 \times 10^{-24} \text{ Am}^2 (= \text{kg.m / s} = \text{N.s})$$

So, what are the physicians measuring?

h – Planck's constant

me – Mass of the electron

c – Light speed

qm – Unitary magnetic charge

qe – Unitary electric charge

xe – Wavelength of the electron