

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

A surprising answer in the search for a comprehensive health protection exposure metric for radiofrequency (RF) fields MARJORIE LUNDQUIST¹, The Bioelectromagnetic Hygiene Institute — Matter can interact with light in 3 different ways (known by 1910): by absorption of energy [*thermal* hazard] or by absorption of linear momentum (radiation pressure) or of angular momentum (torque) or of both [*nonthermal* hazards].^{1,2} The same is true for RF fields; indeed, microwave wattmeters may operate on a momentum absorption principle.^{3,4} But most RF health protection standards today are based solely on *thermal* effects, ignoring nonthermal effects. Formal expressions for scientifically valid exposure metrics will be presented. It will be shown that nonthermal effects depend on field frequency, polarization and spatial configuration as well as on field strength, so a *general* metric valid for *all* fields may not exist. But with some approximations, the *magnetic induction current* may constitute an adequate *practical* exposure metric for RF fields. ¹M. Lundquist, BAPS **50**(1):620(2005). ²M. Lundquist, BAPS **50**(1):1178(2005). ³A. L. Cullen, Proc. IEE **99Pt4**(2):100-110(Apr 1952). ⁴A. L. Cullen & I. M. Stephenson, Proc. IEE **99Pt4**(4):294-301(Dec 1952).

¹P.O. Box 11831, Milwaukee WI 53211-0831 USA

Marjorie Lundquist
The Bioelectromagnetic Hygiene Institute

Date submitted: 30 Nov 2005

Electronic form version 1.4