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Electromagnetic Radiation of a Decelerating Moving de Broglie Particle: An Always Redshift J.X. ZHENG-JOHANSSON, IOFPR, SWE, P-I. JOHANSSON, Uppsala Univ. SWE — We observe that the electromagnetic (EM) radiation from the deceleration of a de Broglie particle as a moving source is always red-shifted, a phenomenon also clearly demonstrated in e.g. the moving hydrogen experiment by H.E. Ives and G.R. Stilwell, J. Opt. Soc. Am. **28**, 215(1938)[1]. The redshift in [1] is $\delta\lambda/\lambda_0 = (\sqrt{v^2}/c)/\gamma$ with $\gamma = 1/\sqrt{1-(v/c)^2}$, for the EM radiation of an orbiting electron decelerated by falling to an inner orbit which, following its hydrogen ion driven by an applied field, has a translational velocity v; c is the velocity of light. In other words, by the redshift in radiation of the above type one is unable to tell whether the particle is moving away or toward the observer except for the $|v|$. Here the radiation frequency equals the de Broglie frequency ω_d of a corresponding particle (effectively the difference between electron's initial and final states in [1]) which adds in full to the particle's mass M as $Mc^2 + (1/2)\hbar\omega_d$. This is characteristically distinct from a conventional moving source which exhibits the usual Doppler effect informing the direction of source motion. The latter source is typically a charged object brought into oscillation of frequency Ω_a by an applied disturbance transverse to its EM wave propagation and source translation; Ω_a in general does not add coherently to the oscillator's mass. The two mechanisms can be clearer expounded in our particle formation scheme outlined e.g. in physics/0501037.

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