

GRAVITATIONAL REDSHIFT IN THE POST-NEWTONIAN POTENTIAL FIELD: THE SCHWARZSCHILD PROBLEM

Diana Constantin

Astronomical Institute of the Romanian Academy, Bucharest, Romania

Considering both the special and general relativistic approximations, we analyze the gravitational redshift in the Schwarzschild problem (i.e. the two body problem associated to a potential of the form $A/r + C/r^3$, where r = distance between photon and the center of a star, and A, C well-established positive constants). We present the difference between the redshift for Newton's potential and the one for Schwarzschild's potential in the third order terms. In both cases (special and general relativistic approximations) the difference value reaches the ratio γ/R^3 , where R = the geometrical radius of the star and $\gamma = C/c^2$, c = speed of the light). In the general relativistic approximation, we show that a black hole effect appears at a ratio noted by us Q_s which is larger than R_s - Schwarzschild gravitational radius.

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