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Effects of Gravitational Waves on a Highly Excited Hydrogen-like Atom NONTAPAT WANWIENG, Department of Physics and Materials Science, Faculty of Science, Chaing Mai University, Chiang Mai, Thailand, APIMOOK WATCHARANGKOOL, National Astronomical Research Institute of Thailand (NARIT), Chiang Mai, Thailand, NITHIWADEE THAICHAROEN, Faculty of Science, Chaing Mai University, Chiang Mai, Thailand, NARUPON CHATTRAPIBAN, Department of Physics and Materials Science, Faculty of Science, Chaing Mai University, Chiang Mai, Thailand — Effects of gravitational waves on a highly excited hydrogen-like atom near ionization threshold are investigated. The plane gravitational waves are described on the basis of Linearized General Relativity. The quantum mechanical description of electron coupled to the field of gravitational waves and electromagnetic is governed by the generalized Dirac equation to curved spacetime. To obtained systematically the physical interpretation of interaction terms in non-relativistic limit, the Exact Foldy-Wouthuysen (EFW) transformation has been performed. Then the calculation of energy correction and deviation of Rabi oscillation are carried out on the perturbation theory approach. The discussion of sensitivity to the gravitational waves generated from the compact astronomical sources are also presented.

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