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Magnetic resonance spectroscopy by magnetic field modulation for spinor Bose condensates AKIYUKI TOKUNO, College de France; CPHT, Ecole Polytechnique, SHUN UCHINO, DPMC, University of Geneva — Spinor Bose-Einstein condensates in the presence of magnetic fields exhibit nontrivial spin orders caused by peculiar effects to atoms such as spin dependent interactions and quadratic Zeeman splitting. For such a system, one of the challenges is to develop measurement techniques to capture complicated spin orders. As an attempt for this issue we theoretically study resonance phenomena induced by magnetic fields.[1] Assuming a dynamically modulated magnetic field, we formulate the experimentally measurable energy absorption rate (EAR) for spin-F interacting bosons within linear response theory. The EAR spectrum is found to be described by a new type of spin correlation function: the autocorrelation of a quadratic Zeeman term. In addition, in order to test whether the states with different spinor order can be specified from the viewpoint of such a spectral feature, we consider spin-1 Bose condensate, and calculate the EAR spectrum of the ordered states by using Bogoliubov theory. As a result the spectrum in each phase is found to show individual characteristic behavior, and this spectroscopy is expected to have possibility to specify various magnetic states in other systems. [1] A. Tokuno and S. Uchino, Phys. Rev. A 87, 061604 (2013).

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