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Magnetic Excitations in Multiferroic $GdMn_2O_5$. SERGEY POGHOSYAN, SERGEY ARTYUKHIN, Istituto Italiano di Tecnologia — Orthorhombic $R Mn_2O_5$ compounds recently attracted attention due to a complex frustrated ground state and unconventional excitations. $Y Mn_2O_5$ with non-magnetic rare earth (RE) shows incommensurate spiral state with spins in the neighbouring chains aligned at 90-degrees to each other [1]. RE ions with unquenched angular momentum enable the control of polarization by magnetic field in the multiferroic materials, such as $Tb Mn_2O_5$ [2]. Strongly $Gd Mn_2O_5$, with magnetic rare earth in $S=7/2$, $L=0$ state, exhibits a spiral state below 40K, that concedes to a commensurate state below $\sim 30K$. The latter hosts large magnetically-induced polarization of $3600 \mu C/m^2$ induced via Heisenberg exchange striction mechanism. This polarization changes by $5000 \mu C/m^2$ under the external magnetic field [3]. Here we corroborate THz magnetoabsorption data with the microscopic modelling. The magnetic excitations are calculated using model Hamiltonian with parameters extracted from ab-initio simulations.

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