Abstract Submitted
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The consequences of the pressure-induced *spinel* – *post spinel* transition upon the electronic properties of $MgFe_2O_4$[1] MARK NIKOLAEVSKY, ERAN GRINBERG, WEIMING XU, GREGORY KH. ROSENBERG, MOSHE P. PASTERNAK, School of Physics and Astronomy, Tel Aviv University, AVIVA MALCHIOR, Nuclear Research Center Negev — Similar to magnetite the ferrimagnetic magnesioferrite (SG *Fd3m* T_N = 710 K) is a an *inverse* spinel $(Fe^{3+})_A(Mg^{2+}Fe^{3+})_B$ in which the A and B are 4- and 6- coordinated moieties, respectively. At $\sim$ 25 GPa a 1^{st} order structural transition takes place into a denser, the so called, post-spinel (*ps*) structure. The few studies carried out so far concluded that the *ps* structure is either of the $CaMn_2O_4$ or $CaTi_2O_4$ -type. Our preliminary HP Mössbauer studies (MS) have unambiguously revealed two Fe sites contradicting the one Fe-site typical of the $CaMn_2O_4$ or the $CaTi_2O_4$ polymorphs. This presentation describes the evolution of the electronic/magnetic properties of the *ps* phase of $MgFe_2O_4$ up to 80 GPa. Experiments at variable-T were carried out with MS and electrical resistance R both at compression and decompression. At 47 GPa ($>P_{s\rightarrow ps}$) the Mössbauer spectra reveals a paramagnetic state at RT composed of two -quadrupole-split sites which magnetically orders at $T < T_N$ (= 220 K). Two fully magnetic split components are present at T <53 K. $R(P, 300K)$ $R(P)$ increases sharply reaching a peak at 20 GPa and drops continuously by 10^{-6} at P >50 GPa. By decompression to $\sim$ 4 GPa the electronic/magnetic properties remain typical of the *ps* phase.

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