CAN WE TEST EXISTENCE OF SUPER STRONG MAGNETIC FIELDS IN MAGNETARS?

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For the last several years existence of the super strong magnetic fields is extensively discussed in the context of magnetars. Standard formula for the magnetic field $B_s = 6.4 \times 10^{19}\sqrt{P\dot{P}}$, which follows from the assumption that spin down of the star is caused by magnetic dipole radiation, yields for characteristic magnetic fields of magnetars $B_s \sim 10^{14}-10^{15}$ G. Therefore, it is usually supposed that magnetic field in magnetars exceeds Schwinger critical value of the magnetic field $B_{QED} = m^2c^3/e\hbar = 4.4\times10^{13}$ G. For the fields $B > B_{QED}$ photon decay ($\gamma \to \gamma' + \gamma''$) becomes mere probable than pair creation ($\gamma \to e^- + e^+$), and therefore it is usually assumed that there should be no radio emission from magnetars, because radio emission is generated in pair plasma. However, radio emission from magnetars has been revealed in Pushchino Radioastronomy Observatory and confirmed by other observations. Besides, interpretation of the recently observed wide patches of the spectrum as electron cyclotron line leads to much lower estimate $B_s \sim 10^{12}$ Gauss. We study quantum effects of induced synchrotron radiation in super strong magnetic fields. Conditions when induced synchrotron radiation becomes greater then induced absorbtion (synchrotron maser) are found. The maser radiation should be observable for neutron stars with super strong magnetic fields. This radiation could be used as a test for detection of super strong magnetic fields.