Abstract Submitted
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Study of Strong Magnetic Fields Using Parametric Instability in a Magnetised Plasma[1] V.V. IVANOV, University of Nevada, Reno, A.V. MAXIMOV, University of Rochester, A.A. ANDERSON, B.S. BAUER, K. YATES, University of Nevada, Reno — Generation of strong magnetic fields with a strength of 10-50MG plays a key role in some recent conceptions for controlled fusion. We suggest a laser method for measuring the local magnetic field, B>10MG, based on the parametric decay of the laser radiation to $\omega/2$ and $3/2\omega$ harmonics which are generated in the area with the electron density of a quarter of the critical plasma density. Spectral components of parametric harmonics carry a signature of both the plasma temperature and strong magnetic field. A two-plasmon decay of laser radiation was studied in a magnetized plasma at the 1MA pulsed power Zebra facility at the University of Nevada, Reno. Dense magnetized plasma with a magnetic field of 1-3MG was created by the 1MA current flowing in the metal rod 0.7-2mm in diameter. Radiation from the narrowband laser with intensity $>10^{14}$ W/cm^2 was focused on the surface plasma. Spectrum of the backscattering $3/2\omega$ harmonic included "red" and "blue" shifted components. Large 2-3nm shifts of spectral components was identified with laser heating of plasma. Components with a small 0.1nm spectral shift of may be linked to the magnetic field.

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