Resonant amplification of the magnetic field by dielectric ring magnetic dipole

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NPP 2021 NON-IDEAL PLASMA PHYSICS Annual Moscow Workshop

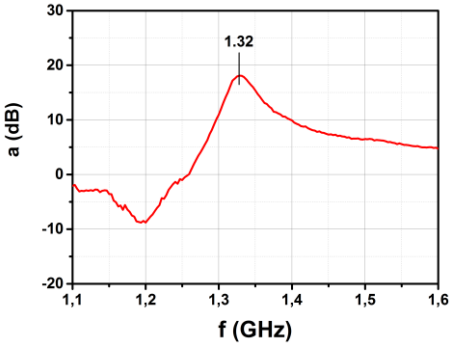

Fig. 1. Experimental scattering spectrum in the vicinity of the main magnetic resonance of dielectric ring with diameters of 38x28 mm and rectangle cross-section of 5×5 mm, ε ≈ 200.

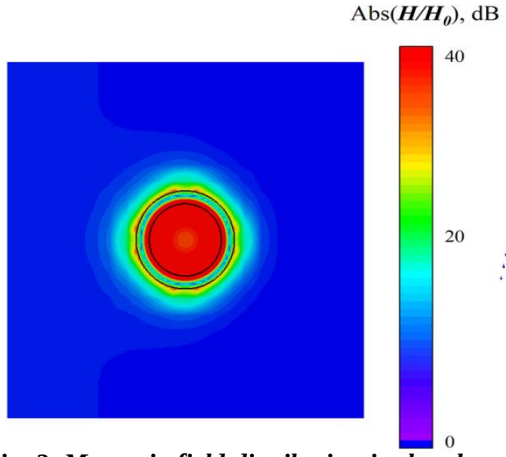

Fig. 2. Magnetic field distribution in the plan of the center longitudinal section of the ring.

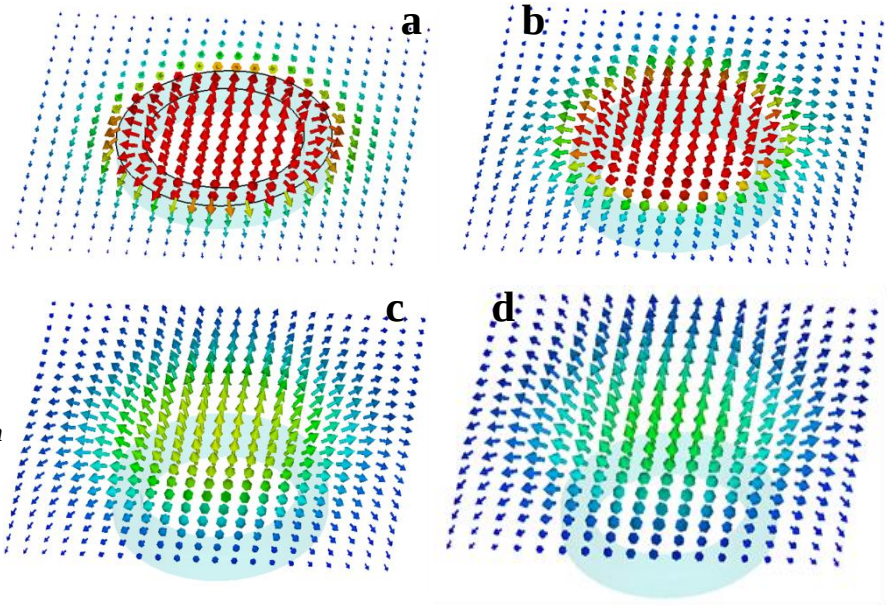

Fig. 5. Vector form distribution of magnetic field in the plane of the longitudinal section of the ring at the different altitudes h. a - 0 mm; b - 5 mm; c - 10 mm; d - 15 mm.

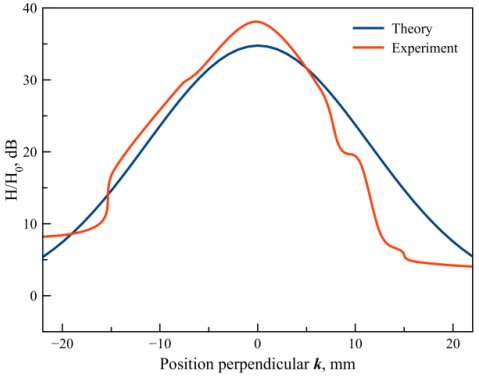

Fig. 3. Measured (smoothed) and simulated resonant amplitudes $|H/H_0|$ at different distances from ring center in case of and perpendicular orientation to wavevector. The distance between ring and probe planes is 1 mm.

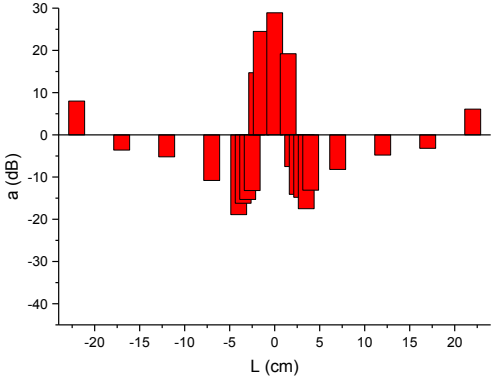

Fig. 4. Resonant amplitudes a measured on different distances from ring center perpendicular to wavevector. The distance between ring and probe planes is 5 mm.

The measured resonance spectra and magnetic field distributions are consistent with computer simulation. Based on the results of measurements and calculations, it can be concluded that the flat dielectric ring is the magnetic dipole with displacement currents, magnetic fields can be calculated based on the Bio-Savard-Laplace law, and the dielectric ring can be used as the magnetic dipole for various studies and applications.