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Physical Models of a Toroidal Dipole DUKE FORSYTH, KIARASH AKHLAGHI, MARTIN AZIR, VIKRAM SARKHEL, WALERIAN MAJEWSKI, Northern Virginia Community College, Annandale, VA — We are investigating two models of the third (after well-known electric and magnetic dipoles) elementary dipole - the toroidal dipole. Its electric model is a toroidal coil connected to a DC or AC voltage, its magnetic version is a circumferentially magnetized ring of neodymium, at rest or rotating. DC electric and magnetic toroids produce only inner magnetic field, and interact directly with a curl of the external magnetic field, that is - with a conductive current density or with a displacement current. Toroidal dipole moment was measured in interaction with the external current and compared with a calculated theoretical value. Rotating magnetic toroid or the AC electric toroid should each act as an electric dipole antenna and produce electric dipole radiation. We are attempting to detect and measure their near-zone electromagnetic fields, as well as an integrated value of the external magnetic vector potential A .

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