Poloidal currents in COMPASS vacuum vessel during symmetrical disruptions: measurements using diamagnetic loop and comparison with CarMa0NL modelling


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For the first time diamagnetic measurements were used to calculate poloidal current in the tokamak vacuum vessel during thermal and current quenches as was recently proposed in [1]. The experimental results are compared with analytical predictions [2] and numerical modelling with CarMa0NL code [3] considering the wall resistivity and geometry.

The COMPASS tokamak has a unique set of diagnostics for measuring of poloidal distribution of poloidal current in the vessel, specifically, 3x24 sensors for the toroidal magnetic field (toroidal Mirnov coils) in three different toroidal locations [4, 5]. This feature allowed to distinguish between different poloidal harmonics of the poloidal current and to perform comparison with the diamagnetic measurements.