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Development and implementation of an external diamagnetic loop on LTX-β[1] ALEXANDRA LEVINESS, DENNIS BOYLE, Princeton Plasma Physics Laboratory, CHRIS HANSEN, University of Washington, PAUL HUGHES, RICHARD MAJESKI, Princeton Plasma Physics Laboratory — The diagnostic set for LTX-β, the upgrade to the Lithium Tokamak Experiment, already includes a compensated diamagnetic loop within the vacuum vessel for determination of the plasma pressure—key for measuring stored energy and energy confinement time. We describe the development and implementation of a second compensated diamagnetic loop, external to the vacuum vessel, for confirmation of the internal loop's measurements. This second loop makes use of an empty cooling channel within the center stack and is more easily accessed for alignment, given its external position. One additional challenge of this external loop is the inclusion of a small amount of toroidal flux between the Ohmic solenoid coil and its return conductor in the center stack, which must be compensated for. The measurements from this loop are compared against those from the internal loop and kinetic diagnostics, and will be added to equilibrium reconstructions. Additionally, as LTX-β now includes a neutral beam, the loop can help to diagnose plasma heating during beam injection.

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