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Velocity measurements in rotating Rayleigh-Bénard convection and the Boundary Zonal Flow[1] MARCEL WEDI, Max Planck Institute for Dynamics and Self-Organization, Germany, DENIS FUNFSCHILLING, Universite de Strasbourg, France, STEPHAN WEISS, Max Planck Institute for Dynamics and Self-Organization, Germany — Rotating turbulent thermal convection is of great importance in various astro- and geophysical systems, where the buoyancy driven flow strongly influenced by Coriolis forces due to rotation of the celestial bodies. It has been studied for decades in the so-called Rayleigh-Bénard setup, where a horizontal fluid layer is heated at the bottom and cooled at the top and rotated around the vertical axis. We investigate the horizontal velocity field using 2D-particle image velocimetry (PIV) in a cylindrical cell ($H = 196\,\mathrm{mm}$ high) with aspect ratio $\Gamma = D/H = 1$. We use water and various water-glycerol mixtures as working fluid resulting in a Prandtl number (Pr) in the range $6 \leq Pr \leq 70$ and Rayleigh numbers $10^8 < Ra < 2 \times 10^9$. With our rotating table we reach Ek as low as 10^{-5}. We are mainly interested in studying the recently discovered *Boundary Zonal Flow* (BZF, see Zhang et al., Phys.Rev.Lett. 2020). The BZF is observed in a region close to the lateral sidewall with a cyclonic flow, i.e, a positive mean azimuthal velocity that is separated from and anticyclonic bulk, with negative mean azimuthal velocity. We measure the size of the BZF as a function of Ek and Ra, and compare the results with DNS (Zhang and Shishkina, 2020).

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