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Flow measurements in rapidly rotating Rayleigh-Bénard convection[1] MATTEO MADONIA, ANDRÉS AGUIRRE-GUZMÁN, HERMAN CLERCX, RUDIE KUNNEN, Eindhoven Univ of Tech — The problem of turbulent rotating Rayleigh-Bénard convection has been studied for a long time due to its strong ties with the flows in geophysics and astrophysics. Its simple formulation, a layer of fluid heated from below and cooled from above rotating about an axis, makes it a good model to tackle this problem from many directions: analytical models, numerical simulations as well as experimental setups. The setup TROCONVEX is one of them. Its huge dimensions (up to 4 m tall) allow the investigation of parameters closer than ever before to the ones of astrophysical flows. In this talk we present flow measurements from this unique experimental setup using stereoscopic Particle Image Velocimetry. This technique lets us measure the 3 components of the velocity field in a full horizontal planar cross-section of our rotating cylinder. Through them we can characterize flow structures and velocity distributions of the different states of the geostrophic regime of rotating convection, a regime characterized by both strong thermal forcing and rapid rotation.

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