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Experimental investigation of the Boundary Zonal Flow (BZF) in rotating turbulent convection[1] STEPHAN WEISS, Max Planck Institute f. Dynamics and Self-Organisation, DENNIS VAN GILS, University Twente, MARCEL WEDI, XUAN ZHANG, Max Planck Institute f. Dynamics and Self-Organisation, SUSANNE HORN, Coventry University, LUKAS ZWIRNER, Max Planck Institute f. Dynamics and Self-Organisation, ROBERT ECKE, Los Alamos National Laboratory, OLGA SHISHKINA, Max Planck Institute f. Dynamics and Self-Organisation, GUENTER AHLERS, University of California, Santa Barbara, EBERHARD BODENSCHATZ, Max Planck Institute f. Dynamics and Self-Organisation, INTERNATIONAL COLLABORATION FOR TURBULENCE RESEARCH (ICTR) COLLABORATION — We report on measurements in rotating turbulent Rayleigh-Bénard convection, in a 2.20 m high cylindrical cell of aspect ratio between its diameter and height of $\Gamma = 1/2$. The working fluids are nitrogen and pressurized (up to 19 bar) sulfur hexafluoride (SF_6). We cover a large Rayleigh number range of $5 \times 10^9 \leq Ra \leq 5 \times 10^{14}$ at Prandtl numbers in the range $0.74 \leq Pr \leq 0.96$. Using thermal probes close to the cylindrical sidewalls we measure characteristic properties of the recently found boundary zonal flow (BZF) as a function of Ra and the rotation rate, i.e., the inverse Rossby number (1/Ro). We also discuss in our talk the influence of the BZF on the heat transport.

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Stephan Weiss
Max Planck Institute f. Dynamics and Self-Organisation

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