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**Retrograde rotation of the large-scale circulation in turbulent rotating Rayleigh-Benard convection at large Rossby numbers up to 200<sup>1</sup>**  
HUI-MIN LI, JIN-QIANG ZHONG, Tongji University, Shanghai, China — We examine the azimuthal rotation of the large-scale circulation (LSC) for turbulent Rayleigh-Benard convection in the presence of weak rotations about a vertical axis at angular velocities  $1.0 \times 10^{-3} \leq \Omega \leq 0.1$  (rad/s). Over the entire Rossby-number range  $1 \leq Ro \leq 200$  studied, linear retrograde rotations of the LSC circulating plane are observed. With increasing  $Ro$  ( $\sim 1/\Omega$ ) the retrograde rotating velocity  $\langle -\dot{\theta} \rangle$  decreases monotonically, but the ratio  $\gamma = \langle -\dot{\theta} \rangle / \Omega$  experiences a transition at  $Ro^* \approx 80$  above which  $\gamma$  increases sharply. We discuss the  $Ro$ -dependence of  $\gamma$  for  $Ro > Ro^*$  and show that a maximum ratio  $\gamma_{max} = 0.36$  is observed at  $Ro = 200$ , more than twice larger than other results reported before in a lower- $Ro$  regime [1]. The experimental findings may shed new light to interpret the low precession rate under weak Coriolis force within the framework of the LSC models [2].

[1] J. E. Hart, S. Kittelman, and D. R. Ohlsen, Phys. Fluids 14, 955 (2002); J.-Q. Zhong and G. Ahlers, J. Fluid. Mech. 665, 300 (2010).

[2] E. Brown and G. Ahlers, Phys. Fluids 18, 125108 (2006).

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