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**Rotating Rayleigh-Bnard convection at low Prandtl number** ANDRES AGUIRRE GUZMAN, Eindhoven University of Technology., RODOLFO OSTILLA-MONICO, Harvard University, HERMAN CLERCX, RUDIE KUNNEN, Eindhoven University of Technology — Most geo- and astrophysical convective flows are too remote or too complex for direct measurements of the physical quantities involved, and thus a reduced framework with the main physical constituents is beneficial. This approach is given by the problem of rotating Rayleigh-Bénard convection (RRBC). For large-scale systems, the governing parameters of RRBC take extreme values, leading to the geostrophic turbulent regime. We perform Direct Numerical Simulations to investigate the transition to this regime at low Prandtl number ($Pr$). In low-$Pr$ fluids, thermal diffusivity dominates over momentum diffusivity; we use $Pr = 0.1$, relevant to liquid metals. In particular, we study the convective heat transfer (Nusselt number $Nu$) as a function of rotation (assessed by the Ekman number $Ek$). The strength of the buoyant forcing (Rayleigh number $Ra$) is $Ra = 1 \times 10^{10}$ to ensure turbulent convection. Varying $Ek$, we observe a change of the power-law scaling $Nu \propto Ek^{\beta}$ that suggests a transition to geostrophic turbulence, which is likely to occur at $Ek = 9 \times 10^{-7}$. The thermal boundary layer thickness, however, may suggest a transition at lower Ekman numbers, indicating that perhaps not all statistical quantities show a transitional behaviour at the same $Ek$.

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