

Abstract Submitted
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Non-Boussinesq effects on heat transport in turbulent Rayleigh-Bénard convection of gases¹ DENIS FUNFSCHILLING, UCSB, GUENTER AHLERS, UCSB — In turbulent Rayleigh-Bénard convection large temperature differences often are used in order to reach very high Rayleigh numbers. This can lead to a breakdown of the Boussinesq approximation which assumes temperature-independent fluid properties. We presents quantitative measurements of non-Boussinesq (NB) effects on the heat transport obtained by using Ethane gas at a mean temperature of 40°C and pressures up to 40 bars. At the largest temperature differences of about 40°C, where the top of the sample approached the vapor-liquid saturation curve, the Nusselt number was **increased** above the Boussinesq value by several percent. This contrasts with NB effects in liquids² where the heat transport is reduced below the Boussinesq value.

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²G. Ahlers, E. Brown, D. Funfschilling, S. Grossmann, and D. Lohse, J. Fluid Mech., submitted.

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