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Nonlinear Processes in Geophysics

Corrigendum to

"Breeding and predictability in the baroclinic rotating annulus using a perfect model" published in Nonlin. Processes Geophys., 15, 469–487, 2008

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The authors regret that there are a number of minor errors in this paper, which should be corrected. They do not affect the results or conclusions of the work.

The Taylor numbers ($\mathcal{T}$) and thermal Rossby numbers (Θ) quoted in this work are incorrect. Our calculations of $\mathcal{T}$ and Θ used the kinematic viscosity $\nu = 1.66 \times 10^{-2}\,\mathrm{cm^2\,s^{-1}}$ and volumetric expansion coefficient $\alpha = (-1/\rho)\partial\rho/\partial T = 2.86 \times 10^{-4}\,\mathrm{K^{-1}}$ from the "main comparison" in Table 1 of Hignett et al. (1985), but the values in this table apply to laboratory measurements. Because we used the equations below that table in our numerical model to calculate ν and ρ as a function of temperature, we should instead have used these equations to find the values of ν and α when calculating the Taylor and thermal Rossby numbers. These equations give $\nu = 1.715 \times 10^{-2}\,\mathrm{cm^2\,s^{-1}}$ and $\alpha = 2.755 \times 10^{-4}\,\mathrm{K^{-1}}$ at 20 °C. The equations used to calculate the fluid parameters are already included in our model, so just the quoted values are incorrect.

Taylor number varies with ν^{-2}, so to obtain the correct values our quoted Taylor numbers are multiplied by

$$\left(\frac{1.66 \times 10^{-2}}{1.715 \times 10^{-2}}\right)^2 = 0.9372$$

Thermal Rossby number varies with α, so to obtain the correct values our quoted thermal Rossby numbers are multiplied by

$$\frac{2.755 \times 10^{-4}}{2.86 \times 10^{-4}} = 0.9633$$

For the same reason the quoted Prandtl number is incorrect. Using the equations in Hignett et al. (1985) the thermal diffusivity is $\kappa = 1.284 \times 10^{-3}\,\mathrm{cm^2\,s^{-1}}$ at 20 °C, which makes the Prandtl number ν/κ quoted in Table 1 equal to 13.4 instead of 13.1.

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