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Linear stability of steady flow in a precessing sphere – Global and local disturbances SHIGEO KIDA, Doshisha University — It is known by the linear stability of the steady flow in a precessing sphere that the critical curve behaves as Po=7.9/Re**0.5 for global disturbances at large Re, where Po is the Poincare number and Re is the Reynolds number (Kida 2013). Here we perform the linear stability analysis of the local disturbances localized in the critical regions and the conical shear layer emerging wherefrom, and show that the asymptotic form of the critical curve is Po=21.25/Re**0.8 and that this result agrees with the corresponding labolabory experiment. On the other hand, the critical curve for the global disturbances is not observed in the experiment of a precessing sphere but in the experiment of a slightly elongated spheroid, the minor-to-major axis ratio being 0.9 (Goto et al. 2014). These correspondences between theory and experiment can be understood by noting that conical shear layers exist stably only for a spherical cavity.

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