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Spiral instabilities in a non-homogeneously heated fluid in cylindrical geometry[1] ANA MARIA MANCHO[2], CSIC, MARIA CRUZ NAVARRO[3], HENAR HERRERO[3], Universidad de Castilla-La Mancha — We present results on the instabilities that appear in a fluid which is in a cylindrical container when a localized Gaussian-like heating around the origin is applied at the bottom. The instability is due to buoyant effects either with radial or vertical gravity. As soon as the horizontal thermal gradient is non-zero a stationary basic state sets in. In contrast to classical Rayleigh-Bernard convection several heat related parameters –not just the vertical temperature gradient– control the stability of the basic flow. We discuss bifurcations that at finite Prandtl number appear for different values of these parameters. In particular we find that spiral waves may appear in some cases. Spirals traditionally have been related to chaotic solutions in Rayleigh-Bernard convection. In our work we show spirals that are linearly growing structures of stationary basic solutions under certain heat conditions. Other instabilities are also discussed.

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