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Secondary instability and tertiary states in rotating plane Couette flow CONOR DALY, University of Cambridge, TOBIAS SCHNEIDER, École Polytechnique Fédérale de Lausanne, PHILIPP SCHLATTER, Kungliga Tekniska Högskolan, NIGEL PEAKE, University of Cambridge — Recent experimental studies have shown rich transition behaviour in rotating plane Couette flow (RPCF). In this paper we study the transition in supercritical RPCF theoretically by determination of various equilibria and periodic orbit tertiary states via Floquet analysis on secondary Taylor vortex solutions. Two new tertiary states are discovered which we name oscillatory wavy vortex flow (oWVF) and skewed vortex flow (SVF). We present the bifurcation routes and stability properties of these new tertiary states, alongside a bifurcation procedure whereby a set of defected wavy twist vortices are approached.

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