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One of the most peculiar features on Saturn moon Enceladus is the so-called tiger stripe pattern near its south pole, as first observed in detail by the Cassini spacecraft early 2005. It is generally assumed that the four almost parallel surface lines taht constitute this pattern are faults in the icy surface overlying a confined salty water reservoir. Indeed, later Cassini observations have shown that salty water jets are spawned from the faults.

The remarkable spatial regularity of Enceladus' southern polar region fault lines is reminiscent to that observed at the surface of confined stratified fluids by the action of induced internal waves. Both numerical simulations and water tank experiments indicate that wave attractors emerge in gravitationally (radial salt concentration or temperature differences) or rotationally stratified confined fluids as a function of forcing periodicity and fluid basin geometry.

Both numerical and laboratory experiments are performed to mimic conditions for Enceladus experiencing strong periodic tidal interactions. Constraints are derived from these simulations, on internal properties and characteristics of the reservoir underneath Enceladus' south polar region.