TIFR Centre for Interdisciplinary Sciences
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Seminar

Convective and absolute instabilities in eccentric Taylor-Couette-Poiseuille flow

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While Taylor-Couette flow (between two concentric cylinders in differential rotation) has been extensively studied, only a few investigations have considered the additional effect of either pressure-driven axial flow or eccentricity of the two cylinders. Here, we consider the combined effect of both axial flow and eccentricity. Such a configuration not only leads to very interesting theory, it is also relevant to the oil industry, where instabilities of this flow type often disrupt oil-well drilling operations. By implementing a detailed instability analysis, the spatio-temporal dynamics of perturbations prevailing in this system has been completely characterized. In particular it has been found that eccentricity has always a stabilizing effect on temporal instabilities, but may either enhance or reduce the absolute instability.

Tuesday, May 6th 2014

4:00 PM (Tea/Coffee at 3:30 PM)

Seminar Hall, TCIS