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Bifurcation of Steady Thermo-Capillary Flows of a Binary Mixture

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We study a branching of axially-symmetric thermo-capillary flows of a binary mixture in a Prandtl's boundary layer on a horizontal rigid wall. We reduce the governing system to a boundary-valuer problem for ODE system. We get a number of main regimes numerically and identify the parameter domain where the main regime is not uniquer. We examine the branching of main regimes with the use of branching equations. The bifurcation curves were found numerically. We show that a generic bifurcation creates two secondary counter-rotating flows, while in the case of degeneration two-side bifurcations generate four secondary regimes. The secondary regimes were constructed analytically in the small neighborhoods of the bifurcation points and continued numerically on the exterior of the neighborhoods.The study was supported by RFBR, grant 02-01-00226.

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