

Compactness and singular limits of free boundary problems in the plane

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Abstract:

This talk presents joint work with Nikola Kamburov in which we describe the family of solutions to the one-phase free boundary problem in the disk with simply-connected positive phase. If the curvature is large, then the solution resembles the double hairpin solution discovered by Helein, Hauswirth and Pacard. We prove this in a strong sense that reproduces (and somewhat improves upon) theorems of Colding and Minicozzi concerning minimal surfaces in this simpler context. We will also explain the direct connection between these subjects discovered by M. Traizet.