Phase field approximation of the Steiner problem : a numerical investigation

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We analyze in this talk the abitity of two phase field models to approximate solutions of the Steiner problem. In particular, we first focus on the recent phase field model introduced by Bonnivard, Lemenant and Santambrogio that couples a Cahn Hilliard type functional with a penalyzed term forcing the connectedness of the desired set. We then investigate a second one that should converge to a mean-curvature flow with a preserved topology. Here, the main idea is to consider an Allen Cahn equation with a forcing term whose contribution is to penalize the distance between the interface and its skeleton.