Alexey A. Tuzhlin Stabilization theorems for minimal networks.

We discuss one method enabling to construct various examples of Steiner Minimal Trees (SMT) possessing predetermined properties. It is well-known that each SMT in the Euclidean plane consists of straight segments meeting each other at their ending points by the angles of at least 120° . We call the trees of this local structure by local minimal trees (LMT). Not each LMT is an SMT. Our stabilization theorem states that on any LMT one can add sufficiently dense finite set of boundary points of degree 2 to convert the tree into SMT (this is joint result with A.O.Ivanov). The stabilization theorem was used to obtain a complete description of all possible germs of closed lunes for edges of an SMT (joint result with A.O.Ivanov and O.A.S'edina). Stabilization theorem was generalized to the class of shortest forests with partially free boundary. Namely, we consider a collection of nonintersecting LMTs as the boundary set and join them by a forest to obtain a connected graph; we minimize the lengths of such forests and assume that for each the shortest forest its union G with the boundary LMTs is a LMT. Then we prove that one can provide the boundary LMTs with a sufficiently dense finite set of boundary points of degree 2 to convert G into SMT (joint result with A.O.Ivanov and A.E.Mel'nikova).