Delauney surfaces suspended between spheres

Ivor McGillivray (Bristol)

Abstract. A Delauney surface is a surface of revolution in $\mathbb{R}^3$ with constant mean curvature. We give an existence criterion involving elliptic integrals for Delauney surfaces suspended between concentric spheres with radii r and R and tangential boundary conditions. This problem is related to the Björling problem for CMC surfaces. We give examples of existence and non-existence depending upon the ratio r/R. We discuss some associated curvature inequalities. A motivation for the study is to provide an alternative approach to obtaining isoperimetric inequalities with a log-convex density. We hope to touch on this connection briefly.