

THE FREE BOUNDARY PROBLEM IN THE SPHERE

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ABSTRACT. In 1983, Nitsche used the Hopf Differential to prove that the only minimal disks that intersect the sphere orthogonally must be equatorial. The interest in minimal surfaces with an orthogonal boundary condition has its roots as a partitioning problem for bounded domains. Examples in the sphere include equatorial disks and a particular piece of the catenoid. In this talk, we will revisit the argument for disks and examine how the argument changes when the surface is an annulus. Additionally, we provide an equivalent phrasing of the question in the language of overdetermined PDE.