
HAN HONG, University of British Columbia

Index estimate for free boundary CMC surfaces and isoperimetric problem

Let Ω be a bounded domain in \mathbb{R}^3 , the isoperimetric problem asks: what is the surface in Ω that has least area under fixed volume constraint? The existence of such surface is guaranteed and it must be free boundary constant mean curvature surfaces. We will discuss the geometry and topology of such surfaces Σ . In particular, we will give a lower bound for the Morse index:

$$\text{Index}_w(\Sigma) \geq \frac{2g + r - 4}{6}$$

where g, r are the number of genus and boundary components of the surface, respectively.