

SEMINÁRIO DE GEOMETRIA

The prescribed mean curvature equation in Minkowski 3-space: asymptotics of isolated singularities

Asun Jiménez
UFF

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Abstract. In this talk we will study non-removable isolated singularities of the following quasilinear, non-uniformly elliptic PDE in two variables:

$$(1 - z_y^2)z_{xx} + 2z_x z_y z_{xy} + (1 - z_x^2)z_{yy} = 2\mathcal{H}(1 - z_x^2 - z_y^2)^{3/2},$$

where $\mathcal{H} = \mathcal{H}(x, y, z)$ is a positive function and $z = z(x, y)$ satisfies the ellipticity condition $z_x^2 + z_y^2 < 1$. The solutions of this equation have a geometric interpretation, since they represent spacelike graphs of prescribed mean curvature \mathcal{H} in the Lorentz-Minkowski space \mathbb{L}^3 .

More specifically, we will consider elliptic solutions $z(x, y)$ that are C^2 on a certain punctured disk

$$\Omega = \{(x, y) : (x - x_0)^2 + (y - y_0)^2 < \rho^2\} \subset \mathbb{R}^2,$$

and do not extend smoothly to the puncture (x_0, y_0) . We will describe the asymptotic behavior around such a non-removable isolated singularity, and to classify the associated moduli space.