SEMINÁRIO DE EQUAÇÕES DIFERENCIAIS PARCIAIS

Geometric regularity theory for the Isaacs equation

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Resumo: In this talk, we consider an Isaacs equation and study the regularity of solutions in Sobolev and Hölder spaces. This class of equations arises in the study of two-players, zero-sum, stochastic differential games. In addition, it is a toy-model for non-convex/non-concave operators. In the framework of viscosity solutions, fundamental developments regarding the Isaacs equation have been produced; for example, the existence and uniqueness of solutions. We propose an approximation method, relating the Isaacs operator with a Bellman one. From a heuristic viewpoint, we import regularity from the latter to our problem of interest, by imposing a proximity regime. Distinct regimes yield different classes of estimates, covering the cases of Sobolev and Hölder spaces. We close the talk with some consequences and applications of our results.