

Initial traces and solvability of porous medium equation with power nonlinearity

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We study qualitative properties of initial traces of solutions to the porous medium equation with power nonlinearity, and obtain necessary conditions for the existence of solutions to the corresponding Cauchy problem. Furthermore, we establish sharp sufficient conditions for the existence of solutions to the Cauchy problem using uniformly local Morrey spaces and their variations, and identify the optimal singularities of the initial data for the solvability of the Cauchy problem. This is a joint work with Nobuhito Miyake (Kyushu Univ.) and Ryuichi Sato (Iwate Univ.).