



MAXIMAL REGULARITY IN MORREY SPACES AND ITS APPLICATION TO TWO-DIMENSIONAL KELLER–SEGEL SYSTEM

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Abstract. The aim of this paper is to discuss the maximal regularity of the heat equation in Morrey spaces based on the 2010 paper by Ogawa and Shimizu. What differs from their work is that the Fourier multipliers are used instead of interpolation. Some recent studies on the real interpolation show that Morrey spaces do not interpolate well. The estimate needed in this paper depends on the local means. The norm estimate of local means is transformed into the form which is suitable in the context of the maximal regularity. As an application, the Cauchy problems for the Keller–Segel system are studied. The function spaces used in this paper correspond to the scaling critical case for the Keller–Segel system. An observation shows why Besov–Morrey spaces are suitable for the study of maximal regularity and that some other related spaces are not.

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