Classes of differentiable functions and the convergence of general Fourier Series

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Abstract. In this paper we present the sufficient conditions, which have to be satisfied by the functions of the orthonormal system (ONS), so that the Fourier coefficients of functions of bounded variation would satisfy the conditions of the Menshov – Rademacher theorem. The obtained results are new and the best possible in a certain view. Furthermore, we prove theorems, which show that every orthonormal system contains a subsystem, with respect to which the Fourier series of functions of bounded variation are either convergent almost everywhere, or summable with the Cesaro method. In this paper we also study the convergence of the Fourier series of Lipschitz class functions with respect to complete ONSs and the properties of such optimal multipliers, that guarantee the convergence of the Fourier series of a certain class of functions with respect to general ONSs.