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Zhong Wang* (kyczwang@zqu.edu.cn), Department of Mathematics, ZhaoQing university, GuangDong, PRC, ZhaoQing, GuangDong 526061, Peoples Rep of China, and **Hongyou WU**, Department of Mathematics, NIU, USA, IL 60115. *Spectral Analysis of Conjugate Self-Adjoint Operators*. Preliminary report.

This paper deals with a class of non-self-adjoint operators, i.e., conjugate self-adjoint operators. These operators are self-adjoint only up to a left factor of non-trivial conjugation operators. We deduce some analogue results about the spectrum for conjugate self-adjoint operators. Applying those results to Differential operators, we obtain a sufficiency and necessary conditions for the spectral discreteness of J -selfadjoint differential operator. (Received September 20, 2009)