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Christian A Zorn* (czorn@math.ohio-state.edu), 7069 Sawmill Village Drive, Columbus, OH 43235. *Determining "good test vectors" for the doubling method applied to the groups $\mathrm{Sp}_2(F)$ and $\widetilde{\mathrm{Sp}}_2(F)$.* Preliminary report.

Let $G = \mathrm{Sp}_2(F)$ (the rank 2 symplectic group) and \widetilde{G} be its metaplectic cover with F being a p -adic field with $p \neq 2$. In this talk, we will explore the doubling integral evaluated on certain "good test vectors" for all constituents π of the unramified principal series for both G and \widetilde{G} . These doubling integrals produce certain Euler factors related to the inducing data.

Additionally, we aim to show that one of these test vectors is essentially determined the non-vanishing theta lifts $\theta(\pi, V)$ for various orthogonal spaces V . For instance, for a representation π of \widetilde{G} and a fixed pair of Witt towers $\{V_r^\pm\}_{r=1}^\infty$ determined by a fixed quadratic character (and having opposite Hasse invariants), we see that $\theta(\pi, V)$ should be non-vanishing for precisely one space in the towers of dimension 5. We then construct the relevant "good test vector" for doubling using certain smooth functions on this orthogonal space. (Received August 06, 2007)