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The multiplicity one conjecture for local theta correspondences

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Abstract Over a non-archimedean local field of characteristic zero, we prove multiplicity preservation of local theta correspondences for orthogonal-symplectic dual pairs. The same proof works for dual pairs of unitary groups.

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1 Introduction

Fix a non-archimedean local field k of characteristic zero. Let G be an orthogonal group $\mathrm{O}(m)$, and let G' be a symplectic group $\mathrm{Sp}(2n)$, both defined over k ($m, n > 0$). Then as usual, they form a reductive dual pair in the larger symplectic group $\mathrm{Sp}(2mn)$. Denote by

$$1 \to \{\pm 1\} \to \widetilde{\mathrm{Sp}}(2mn) \to \mathrm{Sp}(2mn) \to 1 \tag{1}$$

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