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**A Note on Howe Duality Correspondence and Isotropy Representations for Unitary Lowest Weight Modules of  $\mathrm{Mp}(n, \mathbb{R})$**

We give a new proof of the Howe duality theorem for the reductive dual pair  $(\mathrm{Sp}(n, \mathbb{R}), \mathrm{O}(k))$  by using the isotropy representations for unitary lowest weight modules of the metaplectic group  $\mathrm{Mp}(n, \mathbb{R})$ . The irreducible representations of  $\mathrm{O}(k)$  appearing in the Howe duality correspondence are specified explicitly by means of the branching rule of the representations of  $\mathrm{O}(k)$  restricted to orthogonal groups of smaller size.

**Keywords:** Metaplectic group, lowest weight module, Howe duality theorem, branching rule, Harish Chandra modules.

**MSC:** 17B10, 22E45, 22E46