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The classical theta correspondence establishes a relationship between automorphic representations on special orthogonal groups and automorphic representations on symplectic groups or their double covers. The correspondence is achieved by using as integral kernel a theta series on the metaplectic double cover of a symplectic group constructed from the Weil representation. In this work we present an extension of this theta correspondence to higher degree covers. The key issue here is that for higher degree covers there is no analogue of the Weil representation, and additional ingredients are needed. Our work reflects a broader paradigm: constructions in automorphic forms that work for algebraic groups or their double covers should often extend to higher degree covers. (Received December 23, 2020)