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CLASSICAL METHOD OF CONSTRUCTING A COMPLETE SET OF IRREDUCIBLE REPRESENTATIONS OF SEMIDIRECT PRODUCT OF A COMPACT GROUP WITH A FINITE GROUP

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Abstract: Let $G = U \rtimes S$ be a group of semidirect product of U compact and S finite. For an irreducible representation (= IR) ρ of U, let $S([\rho])$ be the stationary subgroup in S of the equivalence class $[\rho] \in \widehat{U}$. Intertwining operators $J_\rho(s)$ $(s \in S([\rho]))$ between ρ and ${}^{s^{-1}}\rho$ gives in general a spin (= projective) representation of $S([\rho])$, which is lifted up to a linear representation J'_ρ of a covering group $S([\rho])'$ of $S([\rho])$. Put $\pi^0 := \rho \cdot J'_\rho$, and take a spin representation π^1 of $S([\rho])$ corresponding to the factor set inverse to that of J_ρ, and put $\Pi(\pi^0, \pi^1) = \mathrm{Ind}^G_{U \rtimes S([\rho])}(\pi^0 \boxdot \pi^1)$. We give a simple proof that $\Pi(\pi^0, \pi^1)$ is irreducible and that any IR of G is equivalent to some of $\Pi(\pi^0, \pi^1)$.

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