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R. J. Archbold

Institute of Mathematics, University of Aberdeen, King’s College, Aberdeen AB24 3UE, Scotland, England
r.archbold@abdn.ac.uk

E. Kaniuth

Institut für Mathematik, Universität Paderborn, 33095 Paderborn, Germany
kaniuth@math.uni-paderborn.de

Topological Frobenius Reciprocity for Representations of Nilpotent Groups and Motion Groups

Let G be a locally compact group and H a closed subgroup of G , and let π and τ be irreducible representations of G and H , respectively. If G is compact then, by the classical Frobenius reciprocity theorem, π is contained in the induced representation $\text{ind}_H^G \tau$ if and only if $\pi|_H$ contains τ . Topological Frobenius properties, which a general locally compact group may or may not satisfy, are obtained by replacing containment by weak containment of representations. We investigate the ‘if’ and the ‘only if’ assertions for nilpotent locally compact groups and for motion groups.

Keywords: Locally compact group, nilpotent group, motion group, SIN-group, unitary representation, induced representation, weak containment, topological Frobenius reciprocity, tensor product.

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