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Texas State Topology Seminar

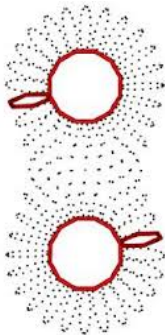Thursday, 2018, December 6, 2:00-3:15 p.m., in DERR 227

Speaker: Weam Al-Tameemi

Topic: *Algebraically Determined Semidirect Products*

ABSTRACT

Let G be a Polish (i.e., complete separable metric topological) group. Define G to be an algebraically determined Polish group if given any Polish group L and an algebraic isomorphism $\varphi : L \to G$, then φ is a topological isomorphism.

The purpose of this presentation is to consider useful sufficient conditions for a semidirect product of two Polish groups to be algebraically determined. A general theorem will be introduced that can provide a flowchart or recipe for proving that some special semidirect products are algebraically determined. For example, it may be used to prove that the natural semidirect product H x G, where H is the additive group of a separable Hilbert space and G is a Polish group of unitaries on H acting transitively on the unit sphere with $-I \in G$, is algebraically determined. An example of such a G is the unitary group of a separable irreducible C∗-algebra with identity on H. Note that, not all nontrivial semidirect products of Polish groups are algebraically determined, for it is known that the Heisenberg group H3(R) is a semidirect product of the form R2 x_θ R1 and is not an algebraically determined Polish group.