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Andrew D Lewis* (andrew.lewis@queensu.ca), Department of Mathematics and Statistics, Queen's University, Kingston, ON K7L 3N6, Canada. *Characterisation of flows using locally convex topologies.*

We consider the problem of characterising the flows of vector fields depending on time and parameter, and depending on the state with various degrees of regularity, e.g., Lipschitz, finitely differentiable, smooth, real analytic, and holomorphic. Dependence on time is measurable, and parameters reside in a general topological space and with dependence on the parameters being continuous.

We give conditions on such vector fields that ensure that the flows depend continuously on parameter and depend on initial condition with the same degree of regularity as the vector field.

The conditions we give are in terms of locally convex topologies for the spaces of vector fields with the prescribed regularity. The topologies are classical in all cases except the real analytic case. In the real analytic case, we give defining seminorms for the topology. The conditions on the vector fields are interesting in that (1) they are given succinctly in terms of the topologies, (2) they agree with known conditions when these exist, and (3) they apply in cases not currently treated in the literature, mainly the real analytic case. (Received July 25, 2018)