

**Vinicio Ríos** (rios@[omit]math.lsu.edu), Departamento de Matemáticas, Facultad Experimental de Ciencias, Universidad del Zulia, Maracaibo, Venezuela, Apartado Postal 526, *Invariance and Some Results on Hamilton-Jacobi Theory for a Type of Discontinuous Differential Inclusions*.<sup>1</sup>

**Abstract.** An important class of discontinuous differential inclusions involves the Dissipative Lipschitz (DL) condition. The aforementioned notion generalizes the concept of dissipativity that is strongly linked to systems with contact phases exhibiting Coulomb friction. The goal of this talk is to summarize recent results obtained on invariance and Hamilton-Jacobi theory under the DL assumption. In the first part we provide a miscellany of necessary and sufficient conditions for systems to be weakly or strongly invariant, including a limiting upper Hamiltonian criterion and an approximate tangential condition that significantly extend the known results in the literature on strong invariance. A Hamilton-Jacobi theory is also announced for the minimal time function of Monotone Lipschitz systems, which are the negative of the DL systems, and a characterization of the graph of the reachable set for DL dynamics is discussed. Finally, some open questions are presented.

**Biographical Sketch.** Vinicio Rafael Ríos was born in the City of Maracaibo, The Zulia State, Venezuela, and received his Licenciado en Matemática Diploma from La Universidad del Zulia, Venezuela in 1995. He also obtained, from the same university, a Magister Scientiarum en Matemática Aplicada in 1999. In 2000, he came to the US to pursue further graduate studies in mathematics. He received a Master of Science in 2002 and his Ph.D. in Mathematics in 2005, both from Louisiana State University in Baton Rouge, under the supervision of Peter R. Wolenski. Since 2005, he has been an Associate Professor in the Department of Mathematics at La Universidad del Zulia in Maracaibo, Venezuela. Vinicio Ríos' research interests are in nonsmooth analysis, nonlinear dynamical systems, optimal control theory, and mathematical modelling.

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<sup>1</sup>The [omit] should be omitted when sending email. It was included here to avoid automatic “harvesting” by spam-list makers.