CRETE CENTER FOR THEORETICAL PHYSICS
Physics Department University of Crete

Christopher Rosen
Physics Department
University of Crete
P.O. Box 2208
710 03 Heraklion
GREECE

Telefax: +30 2810 394 274
Secretary: +30 2810 394 003
Direct Phone: +30 2810 394 254
Email: rosen@physics.uoc.gr

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To Whom it May Concern,

I write in support of the academic merit of the doctoral thesis presented by Sergio Morales Tejera. This thesis presents a collection of notable results obtained by Morales Tejera and collaborators throughout his doctoral studies. The important results presented in this work are logically divided into two distinct lines of research. The first is centred on the out-of-equilibrium dynamics of strongly coupled matter characterised by anomalous transport, while the second advances a line of inquiry into the non-equilibrium physics of non-Hermitian ``*PT*-symmetric'' systems. These investigations are all performed in the framework of gauge/gravity duality, which allows one to investigate such systems by studying the dynamical evolution of a dual classical gravitational theory.

In addition to presenting new insights into the interplay between rotation, momentum relaxation, and anomalous currents, this work attempts to quantify the relevance of the chiral magnetic effect in real world heavy ion collisions. In particular, a quantitative estimate is provided for the plasma equilibration time at both RHIC and the LHC in the presence of the chiral anomaly. These out of equilibrium systems are further extended and explored in several directions in this work.

The second part of the thesis is an investigation of the physics on non-Hermitian systems. In particular, Morales Tejera and collaborators initiate a study of dynamical quenches in such theories. The use of gauge/gravity duality in this context is novel and various interesting results are presented. Most notably, by tracking the dynamical evolution of the system following a quench, the relationship between the unitarity of the evolution and the bulk energy conditions is explored.

Taken in whole, this manuscript certainly achieves the international standards for a doctoral thesis in theoretical physics. The thesis is well written, organised logically, and the calculations presented are of high quality.

Best Regards,

Christopher Rosen

Research Fellow, University of Crete