

Uniqueness of the compactly supported weak solution to the relativistic Vlasov-Darwin system

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We prove uniqueness of weak solutions to the relativistic Vlasov-Darwin (RVD) system under the assumption that the solutions remain compactly supported at all times. Our proof exploits the formulation of the RVD system in terms of the "generalized" space and momentum variables. This formulation permits to rewrite the RVD system in terms of scalar and vector potentials, which allows it to be viewed as a generalization of the Vlasov-Poisson system. We then use optimal transport techniques to study uniqueness of weak solutions for this system. Our proof extends the method used by Loeper (2006) to obtain uniqueness results for the Vlasov-Poisson system.

This is a joint work with R. Sospedra-Alfonso.