Observations on Hyperplanes: II. Dynamical Variables and Localization Observables

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Abstract

This is the second of two papers responding (somewhat belatedly) to ′recent′ commentary on various aspects of hyperplane dependence (HD) by several authors. In this paper I focus on the issues of the general need for HD dynamical variables, the identification of physically meaningful localizable properties, the basis vectors representing such properties and the relationship between the concepts of ′localizable within′ and ′measureable within′. The authors responded to here are de Koning, Halvorson, Clifton and Wallace. In the first paper of this set (Fleming 2003b) I focused on the issues of the relations of HD to state reduction and unitary evolution and addressed comments of Maudlin and Myrvold. The central conclusion argued for in this second paper (§§ 5, 7) is the non-existence of strictly localizable objects or measurement processes and the consequent undermining of the principle of universal microcausality. This contrasts with the existence of strictly localizable properties and results in the consequent priority of the concept of ′localizable within′ over ′measureable within′. The paper opens with discussions of the need for and status of HD dynamical variables which are responses to anonymous queries.

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