Can Classical Description of Physical Reality be Considered Complete?

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Abstract

We propose a definition of physical objects that aims to clarify some interpretational issues in quantum mechanics. We claim that the transformations generated by the objective properties of a physical system must be strictly interpreted as gauge transformations. We will argue that the uncertainty principle is a consequence of the mutual intertwining between objective properties and gauge-dependant properties. The proposed definition implies that in classical mechanics gauge-dependant properties are wrongly considered objective. We will conclude
that, unlike classical mechanics, quantum mechanics provides a
complete objective description of physical systems.

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