Review of: "Mathematics Is Physical"

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In the present paper there are presented the fundamental ways that connect the mathematics and physics. The reader is invited to a lecture organized like an itinerary, by pointing out very interesting and in the meantime actual approaches.

The paper expands some previous author work, based on analysis of Turing machines and a discussion of Godel's theorem.

The section on Turing machines illustrates that a Turing machine is an idealized mechanical device employed for computation. A Turing machine processes classical information that can be cloned. To elucidate this argument, the authors explained in the section 3 the fundamental difference between a classical and a quantum dynamical system.

The analysis proved that the state of a classical dynamical system is classical information, which can be cloned, whereas the state of a quantum dynamical system is quantum information, which cannot be cloned. This distinction between classical and quantum systems is essential and in this sense the section dedicated to unclonable quantum information is accurate. The authors emphasized that quantum computers were inspired by physics and not by mathematics.

In the last section of the paper, the authors brought into attention the Godel's incompleteness theorem which by opposition to the other sections of the paper, illustrates that physics can limit the power of mathematics.

It is a very interesting paper, well arranged, the exposure is accurate and the arguments are very interesting and actual. It is highlighted the fundamental principle that mathematics is ultimately influenced by the underlying physical entities and, in the meantime, some confident predictions are made, such as the potential creation of a new system of dynamics by physicists, in their efforts to unify gravity and quantum mechanics. Such a new dynamical system may provide new connotations to well-established mathematics and offer a new kind of information.