

Abstract Submitted
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Are Complex Numbers Needed in Quantum Mechanics ?

THOMAS HOFFMAN, Brigham Young University — SINCE THE APPEARANCE OF QUANTUM MECHANICS, COMPLEX NUMBERS HAVE PLAYED A FUNDAMENTAL ROLE IN THE THEORY. IN CONTRAST, THE USE OF COMPLEX NUMBERS IN CLASSICAL PHYSICS IS A MATTER OF CHOICE, NOT A NECESSITY. PHYSICISTS HAVE ATTEMPTED TO FORMULATE A VERSION OF QUANTUM MECHANICS WITHOUT COMPLEX NUMBERS TO CAPTURE THE QUANTUM PROPERTIES WITH REAL NUMBERS ONLY. I WILL PRESENT DIFFERENT VIEWPOINTS THAT ARGUE THAT COMPLEX NUMBERS ARE NECESSARY AS WELL AS ATTEMPTS TO DEVELOP PURELY REAL THEORIES. IN PARTICULAR, I WILL DISCUSS A SPECIFIC EXPERIMENTAL PROPOSAL THAT CHALLENGES US TO SETTLE THE ISSUE IN A QUANTIFIABLE MANNER.

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