Are Events Absolute?

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Solving the measurement problem has led to various attempts relying on very different hypotheses. One path is to exit from the standard formalism of Quantum Mechanics (QM) either by extending it (as in de Broglie - Bohm theory, dBB) or by modifying it (as in the spontaneous collapse theories, GRW or Diosi-Penrose). Alternatively, the Everett interpretation embraces multiple outcomes per observer. Changing the standard formalism has the advantage that it is in principle possible to empirically test the candidate theory (unlike dBB theory, whose predictions mirror those of QM under quantum equilibrium). If we want to stay inside the standard formalism, it is necessary to explain why and when the unitarity of the Schrodinger equation describing the evolution of the state of a system is broken to give rise to a collapse (projection principle). Many recent interpretations assume that QM is universal. That means first that it applies to every system independently of its size and even if the system is itself an observer, and second that all physical processes, including measurements, are described by a unitary interaction. However, this does not solve the measurement problem, as it remains unclear how a definite measurement result emerges from a unitary process. This issue sparks philosophical debates, notably around Wigner's friend experiment and its extensions, which explore the non-absoluteness of events and its implications for our understanding of reality. In this paper, we are going to dive into these discussions that shed light on the question of knowing what that means for events to not be absolute (one apparent conclusion of these discussions) and what is the new conception of reality that this implies. This will allow to give a detailed comparison of many so-called perspectival interpretations.