

# The Rotating Discs Argument Defeated

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## Abstract

The rotating discs argument (RDA) against perdurantism has been mostly discussed by metaphysicians, though the argument of course appeals to ideas from classical mechanics, especially about rotation. In contrast, I assess the RDA from the perspective of the philosophy of physics. I argue for three main conclusions.

The first conclusion is that the RDA can be formulated more strongly than is usually recognized: it is not necessary to imagine away the dynamical effects of rotation. The second is that in general relativity, the RDA fails because of frame-dragging.

The third conclusion is that even setting aside general relativity, the strong formulation of the RDA can after all be defeated. Namely, by the perdurantist taking objects in classical mechanics (whether point-particles or continuous bodies) to have only temporally extended, i.e. non-instantaneous, temporal parts: which immediately blocks the RDA. Admittedly, this version of perdurantism defines persistence in a weaker sense of 'definition' than pointilliste versions that aim to define persistence assuming only instantaneous temporal parts. But I argue that temporally extended temporal parts: (i) can do the jobs within the endurantism-perdurantism debate that the perdurantist wants temporal parts to do; and (ii) are supported by both classical and quantum mechanics.

This is an extract from a much longer paper, which is available at:  
<http://philsci-archive.pitt.edu/archive/00001760>.

The main differences are that the longer paper: (i) gives much more detail about the form and scope of the RDA, the interpretative subtleties of classical mechanics, and the physics of rotation; and (ii) reports and assesses several other replies to the RDA, especially those by Callender, Lewis, Robinson and Sider.

**Keywords:** persistence, endurance, perdurance, temporal parts, rotating discs, rotation, classical mechanics, decoherence

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