

Interventionism in Statistical Mechanics: Some Philosophical Remarks

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Abstract

Interventionism is an approach to the foundations of statistical mechanics which says that to explain and predict some of the thermodynamic phenomena we need to take into account the inescapable effect of environmental perturbations on the system of interest, in addition to the system's internal dynamics. The literature on interventionism suffers from a curious dual attitude: the approach is often mentioned as a possible framework for understanding statistical mechanics, only to be quickly and decidedly dismissed. The present paper is an attempt to understand this attraction-repulsion story. It offers a version of interventionism that appears to be defensible, and shows that this version can meet the main objections raised against it. It then investigates some of the philosophical ideas underlying interventionism, and proposes that these may be the source of the resentment interventionism encounters. This paves the way to see some features and consequences of interventionism, often taken to be shortcomings, as philosophically advantageous.

Keywords: statistical mechanics, entropy, the second law of thermodynamics, interventionism, initial conditions

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