

“Reversibility” and Entropy History Independence

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Abstract

According to the explicit propositions by Clausius, in the original publications in the 1850's, the temperatures of the “reservoirs” are irrelevant for the “second fundamental equation” of the “mechanical theory of heat” to hold true. It is shown that entropy being history independent, i.e., “path independent”, “state function”, is contradictory to “reversibility”, i.e., contradictory to the “second fundamental equation” of the “mechanical theory of heat” holding true for “reversible” phenomena, only. This result is corroborated by experimental evidence. This result only removes the unnecessary restriction posed by “reversibility”, causes no adverse practical consequences, and offers the possibility to unify and simplify continuum entropy modeling. For example, the result removes the dilemma due to “reversibility” from engineering calculations for real physical phenomena, none of which are “reversible”.

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