Second-moment closure modelling of turbulence in a non-inertial frame

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This article investigates the performance of second-moment closures in a rotating reference frame and presents a new closure for the rapid pressure–strain rate correlation based on the recently developed materially frame indifference principle. It is observed here that the existing second-moment closures with appropriate near-wall treatment can adequately predict flows in a rotating channel and in an axially rotating pipe for moderate rotation rate. Analysis of the newly proposed model indicates that it is capable of reflecting flow features under strong rotation.

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