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Investigating Cold Gas Filaments in Cool-core Clusters

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Aims. Cold gas ($T \sim 10^4$ K) filamentary structures with Hα emissions were found around central regions of some cool-core galaxy clusters. We wish to compare the results between observation of the Perseus cluster and our simulation in order to interpret velocity structures of observed filaments.
Methods. We perform hydrodynamic simulations to trace gas motions in the Perseus cluster.
Results. In our simulation, filaments with a chaotic velocity structure dominate the population, while those with a uniform velocity structure are secondary. The simulation also produces an overall low velocity dispersion.
Conclusions. The cold gas motions present chaotic more often, whereas observations suggest an uniform structure. On the other hand, the velocity dispersion in the simulation is consistent with the observation results.

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