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**Fine scale eddy cluster in turbulent channel flow** KOSUKE OSAWA, YUKI MINAMOTO, MASAYASU SHIMURA, MAMORU TANAHASHI, Tokyo Institute of Technology — Geometry and distribution of fine scale eddy clusters in wall turbulence are studied. Databases of direct numerical simulation of turbulent channel flow at  $Re_\tau \approx 10^3$  are used for the investigation. To take account of every fine scale eddies existed in the flow independent of their strength, the eddies are identified by their swirling motion. Clustering of the fine scale eddies are evaluated quantitatively by introducing Voronoi diagram. Dimensions and topological properties of the clusters are also studied based on the diagram. The results show that the spacing of individual eddies is roughly scaled by the Taylor micro scale at the given height. Comparison with the result from unbounded turbulence suggests that dimension of the vortex clusters are significantly affected by their distance from the walls. Relative position of the vortex clusters and high and low momentum region is investigated to discuss the role of the vortex clusters in wall turbulence.

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