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Wanping Li* (liwp48@yahoo.com.cn), #1037, Luoyu Road, Hongshan District, Wuhan, Hubei 430074, and **Shuangxi Guo**. *Inverse energy cascade and self-organization in 2-D turbulent channel flow*.

Inverse energy cascade and self-organization in 2-D turbulent channel flow have been investigated in the presentation. Direct numerical simulations (DNS) of forced 2-D turbulent channel flow are performed with the pseudo-spectral method. The results indicate that an obvious self-organization of vortices is existent in 2-D turbulent channel flow. The adjacent and same sign vortices interact with each other and merge to larger ones, and a pair of opposite sign and the largest vortices is formed and maintained ultimately. At the same time, the inverse energy transfer from small structures to larger ones is along with the self-organization process. The differences of mean velocity profiles of 2-D and 3-D turbulent channel flow, and the characteristics of the oceanic circulation like in the Gulf of Aden of Indian Ocean can be explained with the theory of inverse energy cascade and self-organization mechanism. (Received September 10, 2011)