Abstract Submitted
for the DFD19 Meeting of
The American Physical Society

The balance of Reynolds stresses equations in spanwise rotating plane Couette flows at dual states[1] ZHENHUA XIA, Zhejiang University — In this work, the terms in the transport equations of the Reynolds stresses are analysed in spanwise rotating plane Couette flows at two different states. Our results show that they are generally of the same shape at two different states, but the state with more roll cells has a larger value. The energy transfer between the secondary and the residual fields shows that the secondary flows are more energetic at the state with more roll cells while the residual field is more energetic in the other state. Furthermore, a local inverse energy cascade is observed in the near wall region at the latter state with less roll cells where the energy is transferred from the residual field to the secondary flow field. Our results support the conjecture that the large-scale secondary flows play a very important role in the dual states of spanwise rotating plane Couette flows.

[1]the National Science Foundation of China (NSFC Grant Nos. 11822208, 11772297)

Zhenhua Xia
Zhejiang University

Date submitted: 26 Jul 2019 Electronic form version 1.4