Global well-posedness for the generalized Navier-Stokes-Coriolis equations with highly oscillating initial data

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Abstract

We study the small initial date Cauchy problem for the generalized incompressible Navier-Stokes-Coriolis equations in critical hybrid-Besov space $\dot{\mathscr{B}}_{2,\, p}^{\frac{5}{2}-2\alpha, \frac{3}{p}-2\alpha+1}(\mathbb{R}^3)$ with $1/2<\alpha<2$ and $2\leq p\leq 4$. We prove that hybrid-Besov spaces norm of a class of highly osillating initial velocity can be arbitrarily small. and we prove the estimation of highly frequency L^p smoothing effect for generalized Stokes-Coriolis semigroup with $1\leq p\leq\infty$, At the same time, we prove space-time norm estimation of hybrid-Besov spaces for Stokes-Coriolis semigroup. From this result we deduce bilinear estimation in our work space. Our method relies upon Bony's high and low frequency decomposition technology and Banach fixed point theorem.

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