

# Global existence and decay estimate of solution to compressible quantum Navier-Stokes equations with damping

Zhonger Wu<sup>1</sup>, Zhong Tan<sup>1</sup>, and Xu TANG<sup>2</sup>

<sup>1</sup>Xiamen University

<sup>2</sup>Sichuan University

December 8, 2021

## Abstract

In this paper, we consider the Cauchy problem of the compressible quantum Navier-Stokes equations with damping in  $\mathbb{R}^3$ . We first assume that the  $H^3$ -norm of the initial data is sufficiently small while the higher derivative can be arbitrarily large, and prove the global existence of smooth solutions. Then the decay estimate of the solution is derived for the initial data in a homogeneous Sobolev space or Besov space with negative exponent. In addition, the usual  $L^p$ - $L^2(1 - \Delta)^{-p/2}$  type decay rate is obtained without assuming that the  $L^p$ -norm of the initial data is sufficiently small.

## Hosted file

manuscript.pdf available at <https://authorea.com/users/450061/articles/548478-global-existence-and-decay-estimate-of-solution-to-compressible-quantum-navier-stokes-equations-with-damping>