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**Zhaoyang Qiu** and **Yixuan Wang\*** (yiw119@pitt.edu). *Strong Solution for Compressible Liquid Crystal System with Random Force*. Preliminary report.

We study the three-dimensional compressible Navier-Stokes equations coupled with the  $Q$ -tensor equation perturbed by a multiplicative stochastic force, which describes the motion of nematic liquid crystal flows. The local existence and uniqueness of strong pathwise solution up to a positive stopping time is established where “strong” is in both PDE and probability sense. The proof relies on the Galerkin approximation scheme, stochastic compactness, identification of the limit, uniqueness and a cutting-off argument. In the stochastic setting, we develop an extra layer approximation to overcome the difficulty arising from the stochastic integral while constructing the approximate solution. Due to the complex structure of the coupled system, the estimates of the high-order items are also the challenging part in the article. (Received December 31, 2020)