# From correlated to white transport noise in fluid models

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Stochastic fluid model with transport noise are popular, the transport noise models unresolved small scales. The main assumption in these models is a very strong separation of scales allowing this representation of small scales by white - ie fully decorrelated - noise. It is therefore natural to investigate whether these models are limits of models with correlated noises. Also, an advantage of correlated noises is that they allow classical calculus. In particular, it allows to revisit the derivation of stochastic models from variational principle and allows to derive equation for the evolution of the noise components. The advantage of having such equations is that in most works, the noise components are considered as given and stationary with respect to time which is non realistic. Coupling stochastic fluid models with these gives a more realistic system.