



Preferential concentration of neutrally buoyant particles in turbulence?

J. Mann, J. Berg and S. Ott

Risø - DTU, Denmark (jakob.mann@risoe.dk)

In a recent paper by Schmitt and Seuront (J. Mar. Syst., 2007) it was shown that neutrally buoyant particles in a turbulent flow have a tendency to be more orderly than totally randomly distributed. This effect, which is known for particles of different density than the fluid, is termed preferential concentration. This observation can have rather large consequences for the ecology of plankton, for example the contact rate may more than double, so it is worthwhile to study further. Therefore we re-analyze the same data as Schmitt and Seuront, which was based on Ott and Mann (J. Fluid Mech. vol. 422, 2000), together with a much more extensive data set from Berg et al (Phys. Rev. E, vol 74, 2006), which has a different Reynolds number and particle sizes. The result is that we do not see any preferential concentration. We show how a finite volume bias can significantly alter the estimation of the preferential concentration. Also, presence of irregularly shaped tracer particles can cause spurious concentration effects.