



Relative displacement PDFs in turbulence and observations

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Relative dispersion has been examined previously with data from the atmosphere, ocean and turbulence simulations. The focus of such studies is generally on the dispersion, the second order moment of pair separations, or on related measures like the Finite Scale Lyapunov Exponent (FSLE). Relatively little attention has been paid to the probability density functions (PDFs) of the displacements, from which the moments derive. Here we examine PDFs from three sources: 1) synthetic particles in numerical simulations of 2-D turbulence, 2) balloons in the stratosphere and 3) surface drifters in the ocean. We also compare how the evolving PDFs compare to analytical predictions. The results inform us about the kinetic energy spectra in the respective systems. The sub-deformation scales in the atmosphere and ocean are of particular interest.