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Techniques for assimilating Lagrangian data into fluid models

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Lagrangian data offer a challenge to data assimilation as they are not expressed directly in terms of flow variables. On the other hand, they offer an opportunity as they live in a low dimensional space (physical space of 2 or 3 dimensions). The strong nonlinearity of Lagrangian dynamics demands new techniques and we introduce a smoother based on statistical sampling that works well with some of the key nonlinear effects in a fluid flow.