1. Record Nr. UNINA9910832961103321 Price James F Autore Titolo Lagrangian and Eulerian Representations of Fluid Flow:: Kinematics and the Equations of Motion / / James F. Price [s.l.]:,: MIT OpenCourseWare,, 2006 Pubbl/distr/stampa Descrizione fisica 1 online resource (91 p.) Soggetti Science Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia This essay introduces the two methods that are widely used to observe Sommario/riassunto and analyze fluid flows, either by observing the trajectories of specific fluid parcels, which yields what is commonly termed aLagrangian representation, or by observing the fluid velocity at fixed positions, which yields an Eulerianrepresentation. Lagrangian methods are often the most efficient way to sample a fluid flow and the physicalconservation laws are inherently Lagrangian since they apply to moving fluid volumes rather than to the fluidthat happens to be present at some fixed point in space. Nevertheless, the Lagrangian equations of motionapplied to a three-dimensional continuum are quite difficult in most applications, and thus almost all of thetheory (forward calculation) in fluid mechanics is developed within the Eulerian system. Lagrangian and Eulerian concepts and methods are thus used side-by-side in many investigations, and the premise of thisessay is

> that an understanding of both systems and the relationships between them can help form theframework for a study of fluid mechanics.