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Sommario/riassunto

This volume explores and evaluates the development, multiple applications, and usefulness of four-dimensional (space and time) model assimilations of data in the atmospheric and oceanographic sciences and projects their applicability to the earth sciences as a whole. Using the predictive power of geophysical laws incorporated in the general circulation model to produce a background field for comparison with incoming raw observations, the model assimilation process synthesizes diverse, temporarily inconsistent, and spatially incomplete observations from worldwide land, sea, and space data acquisition systems into a coherent representation of an evolving earth system. The book concludes that this subdiscipline is fundamental to the geophysical sciences and presents a basic strategy to extend the application of this subdiscipline to the earth sciences as a whole.