

Alternative perspectives on data
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In this talk alternative approaches to looking at data are discussed. First, data can be viewed in the context of numerical approximations. Secondly, for data with a regular structure, utilising a multi-resolution analysis perspective can allow for sparse representation, accurate detection of discontinuities, and representation of multi+scale physics. While the ability to move data from fine resolutions to coarser resolutions is straight forward utilizing a multi-resolution analysis framework, moving data from a coarse resolution to a finer resolution while reducing errors is more challenging. This relies on incorporating filtering techniques into the multi-resolution analysis framework. This approach has the further advantage of requiring fewer computations to gain insight into calculations such as for Bohm speed [Picklo et al. JCP 2024]. In this talk, we present methods for data enhancement through multi-resolution analysis and the Smoothness-Increasing Accuracy-Conserving (SIAC) filtering framework.

[\[link to pdf\]](#) [\[back to Numdiff-17\]](#)