



## **Advanced Data Interpolating Variational Analysis. Application to climatological data.**

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DIVA is a variational analysis tool designed to interpolate irregularly spaced and noisy data into any desired location, in most cases on regular grids. A distinct advantage of DIVA compared to other analysis tools such as optimal interpolation is its natural way to take into account topographic effects and advection. Moreover, large data sets, frequently encountered in oceanography, do not constitute an obstacle to the application of DIVA.

However, until now, only an approximate error-field estimate was available and only a unique overall length scale could be prescribed. Here we present some improvements brought to the variational analysis tool, allowing one to combine advection constraints, variable correlation length and full error calculation in an efficient way. Furthermore a data-quality control method is added and new tools for parameter optimisation are provided.

The added value of these features are illustrated in the case of a climatological salinity measurements in the Mediterranean Sea. The tools for the estimation of the parameters are tested and the results are assessed using cross-validation.