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Optimisation of the one year POMME experiment bulk fluxes data set using a one dimensional approach together with genetic algorithms

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Among the various optimisation methods, genetic algorithms provide a useful issue when seeking the extrema of complex functions. Such a method, which is based on techniques derived from genetics and population evolution, is here applied to optimise bulk fluxes derived from the POMME experiment (2000-2001, Northeast Atlantic) extended data set, using a one dimensional (1D) approach. Initial turbulent air-sea fluxes averaged over the whole POMME area (38˚N-45˚N, 21˚W-15˚W) are corrected through the introduction of five parameters (multiplying coefficients and/or biases) before being used to force a 1D model. This set of parameters is then optimised through the minimization by the genetic algorithm of a function including surface and profile errors for both the temperature and salinity fields. The optimised set of parameters provided by the genetic algorithm is proved to efficiently correct discrepancies and uncertainties of the forcing fields, as the new 1D evolution obtained on average for the whole POMME area is particularly realistic when compared to the available observations. Efficiency together with limitations of this optimisation method are last drawn.