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Changing the coupling in a class of two field fluid models ANDREW FOSTER, CAVENDISH MCKAY, Marietta College — In fluid dynamics problems, including those arising in plasma physics, it is not uncommon to have nonlinearly coupled systems of field equations. We examine a class of these systems for which a change of basis shifts the coupling out of the nonlinearity and into the associated elliptic problem. We will illustrate and interpret this change of basis in two specific examples: a two layer quasigeostrophic ocean model, and a modified form of reduced MHD. The main motivation for this change of basis is to improve computational efficiency, but it can also lead to significant physical insights.

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