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Mikil Foss and **Joe Geisbauer*** (s-jgeisba1@math.unl.edu). *Extensions of variational methods to non-local functionals*. Preliminary report.

The applications of functionals with non-local integrands has recently become more prevalent, for example in peridynamics, biology, and image processing. As the regularity theory for local problems has been well developed, it is natural to investigate extensions of these regularity results to the non-local setting. In this talk, we will present some new results that provide the existence and increased differentiability, in the context of Besov Spaces, of minimizers for certain non-local functionals. (Received September 19, 2012)