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Brian Pigott* (pigottbj@wfu.edu), Department of Mathematics, Wake Forest University, PO Box 7388, Winston-Salem, NC , and **Sarah Raynor** (raynorsg@wfu.edu), Department of Mathematics, Wake Forest University, PO Box 7388, Winston-Salem, NC 27109. *Asymptotic Stability for KdV Solitons in Weighted Sobolev Spaces.*

We consider the KdV equation in the exponentially weighted Sobolev spaces used by Pego and Weinstein. We prove local well-posedness for the perturbation (weighted and unweighted) in a Besov refinement of the Bourgain space $X^{1,b}$. This allows us to recreate the Pego-Weinstein result using an iteration argument. Combining this with the I -method, we expect to be able to prove asymptotic stability for KdV solitons with initial data too rough to be in H^1 . (Received August 20, 2013)