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Xin Guo* (xinguo@newton.berkeley.edu), 4173 Etcheverry Hall, Dept of IEOR, UC Berkeley, Berkeley, CA 94720-1777, and **Guoliang Wu**. *Smooth Fit Principle for Impulse Control of Multi-dimensional Diffusion Processes*.

Value functions of impulse control problems are known to satisfy Quasi-Variational Inequalities (QVI) (Bensoussan and Lions (1982)). This paper proves the smooth-fit C^1 property of the value function for multi-dimensional controlled diffusions, using a viscosity solution approach. We show by examples how to exploit this regularity property to derive explicitly optimal policy and value function. (Received September 15, 2008)