1057-35-396   **Arshak Petrosyan*** (`arshak@math.purdue.edu`), Department of Mathematics, Purdue University, West Lafayette, IN 47907, and **Tung To** (`tto@math.purdue.edu`), Department of Mathematics, Purdue University, West Lafayette, IN 47907. *Optimal Regularity in Rooftop-Like Obstacle Problem.*

We study the regularity of solutions of the obstacle problem when the obstacle is smooth on each half of the unit ball but only Lipschitz across the shared boundary. We prove that the optimal regularity of these solutions is $C^{1,\frac{1}{2}}$ up to the shared boundary on each half of the unit ball. The proof uses a modification of Almgren's frequency formula. (Received January 26, 2010)