

TEMPLE UNIVERSITY

Department of Mathematics

Analysis Seminar

Room 617 Wachman Hall

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Sufficient conditions for existence of Least Gradient solutions

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Abstract: In this talk we study the following variational problem:

$$\inf \left\{ \int_{\Omega} |Du| : u \in \text{BV}(\Omega), u|_{\partial\Omega} = f \right\}, \quad (1)$$

with Ω a Lipschitz bounded domain and $f \in L^1(\partial\Omega)$. Solutions to (1) are called least gradient functions and do not always exist for every boundary data f . It is well-known that level sets of LG functions are minimal surfaces. Using this geometrical property, we construct solutions to (1) for convex domains Ω and $f \in \text{BV}(\partial\Omega)$ satisfying some monotonicity properties. We also establish a connection between solutions to (1) and variational problems that appear in Free Material Design applications.