

**Title:** A Description of Extremals for Morrey's Inequality.

**Abstract:** Morrey's inequality says: Let  $u \in L^1_{loc}(R^n)$  be such that  $Du \in L^p(R^n)$  and  $p > n$ . Then there is some  $C > 0$  depending only on  $n$  and  $p$  such that

$$C\|Du\|_p \geq [u]_{C^{0,1-n/p}} \quad (0.1)$$

where

$$[u]_{C^{0,1-n/p}} := \sup_{x \neq y} \left\{ \frac{|u(x) - u(y)|}{|x - y|^{1-n/p}} \right\} .$$

Since Morrey's proof 80 years ago, the inequality has found many applications in physical problems, but until recently nothing was proven about the sharp constant or extremals, including whether they exist or not. In a recent project, R. Hynd and I proved the existence of extremals providing a description of their qualitative characteristics. k is a collaboration with R. Hynd.