

TEMPLE UNIVERSITY

Department of Mathematics

Analysis Seminar

Room 617 Wachman Hall

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Recent results on Generated Jacobian Equations

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Abstract: A large number of problems involve mappings with a prescribed Jacobian, from optimal transport mappings to problems of lenses and antenna design in geometric optics. Many of these problems originate from what is now known as a "generating function", e.g. the cost function in optimal transport, in which case the equation is known as Generated Jacobian Equation. This class of equations has been proposed by Trudinger, and it covers not only optimal transport problems, but also near-field problems in optics. In this talk I will discuss work with Jun Kitagawa where we prove Holder continuity for the gradient of weak solutions to GJE, under natural assumptions. The results are in the spirit of, and extend, Caffarelli's theory for the real Monge-Ampere equation. The key observation is that a quasiconvexity property of the underlying generating function (related to MTW tensor) guarantees the validity of an estimate akin to Aleksandrov's estimate for convex functions.