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Image denoising techniques include tools from a number of fields of mathematics including partial differential equations, probability, linear algebra, and both convex and non-convex optimization. Recent work by Bertalmio and Levine has demonstrated that it might be more effective to denoise the curvature of the level lines of a noisy image and then use this ‘denoised’ curvature information to reconstruct an estimate of the original image. The goal of this research is to statistically analyze image curvature data in order to develop better denoising methods for this new framework. In this talk I will give a brief description of the problem: image noise. An analysis of the curvature noise distribution which motivates new techniques for denoising curvature data will follow. We use this information to generate a denoised image using a variational model that incorporates the smoothed level line curvature data while preserving level line contrast. Numerical results using this approach show improvement upon state-of-the art denoising methods. (Received September 22, 2015)