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Wolfgang Ring* (wolfgang.ring@uni-graz.at), Institute of Mathematics, Heinrichstrasse 36, 8010 Graz, Austria, and **Ronny Ramlau**. *A Mumford-Shah approach for the inversion of SPECT data*. Preliminary report.

A Mumford-Shah approach for the simultaneous recovery of density and excitation and the location of singularities of these quantities is proposed. The Mumford-Shah functional is approximated by a reduced Model with the singularity set as the only remaining unknown. The resulting shape optimization problem is treated analytically and a numerical algorithm based on the level-set methodology is suggested. Shape sensitivity analysis is applied to find a descent direction for the geometric variable. (Received September 28, 2005)