1125-90-144 **Maryam Yashtini*** (myashtini3@math.gatech.edu), School of Mathematics, Georgia Institute of Technology, 686 Cherry Street, Atlanta, GA 30332-0160, and **Sung Ha Kang**. *A fast relaxed normal two split method and an effective weighted TV approach for Euler's elastica image inpainting.*

In this talk, I present two numerical algorithms for solving Euler's elastica-based inpainting model. The minimizing functional is non-smooth, non-convex, and involves high-order derivatives, that traditional gradient descent based methods converges very slowly. Recent alternating minimization methods show fast convergence when a good choice of parameters is used. The objective of this talk is to introduce efficient algorithms which have simple structures with a fewer parameters. These methods are based on operator splitting and alternating direction method of multipliers, and sub-problems can be solved efficiently by Fourier transforms and shrinkage operators. For the first method, we relax the normal vector in the curvature term of the Euler's elastica model and exploit two operator splitting techniques to propose a Relaxed Normal two Split (RN2Split) method. The second method, κ-weighted Total Variation (κTV), solves the Euler's elastica minimization problem as a weighted total variation. We present the analytical properties of each algorithm. Various numerical experiments, including comparison with some existing state-of-art algorithms, are presented to show the efficiency and the effectiveness of the proposed RN2Split and κTV methods. (Received August 03, 2016)