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# Partial Lagrangian relaxation for General Quadratic Programming

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**Abstract** We give a complete characterization of constant quadratic functions over an affine variety. This result is used to convexify the objective function of a general quadratic programming problem (Pb) which contains linear equality constraints. Thanks to this convexification, we show that one can express as a semidefinite program the dual of the partial Lagrangian relaxation of (Pb) where the linear constraints are not relaxed. We apply these results by comparing two semidefinite relaxations made from two sets of null quadratic functions over an affine variety.

**Keywords:** Quadratic Programming, Lagrangian relaxations, Semidefinite Programming

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