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I. V. Evstigneev
School of Economic Studies, University of Manchester, Oxford Road, Manchester M13 9PL, Great Britain
igor.evstigneev@man.ac.uk

S. D. Flåm
Dept. of Economics, University of Bergen, Fosswickels gate 6, 5007 Bergen, Norway
sjur.flaam@econ.uib.no

Convex Stochastic Duality and the "Biting Lemma"

A standard approach to duality in stochastic optimization problems with constraints in L_∞ relies upon the Yosida - Hewitt theorem. We develop an alternative technique which employs only "elementary" means. The technique is based on an ε-regularization of the original problem and on passing to the limit as $\varepsilon \to 0$ with the help of a simple measure-theoretic fact – the biting lemma.

Keywords: Stochastic optimization, convex duality, constraints in L-infinity, stochastic Lagrange multipliers, bounded sets in L-1, biting lemma, Gale's economic model.

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