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Some Norm Estimates for Semimartingales

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In this paper we introduce a new type of norms for semimartingales, under both linear and nonlinear expectations. Our norm is defined in the spirit of quasimartingales, and it characterizes square integrable semimartingales. This work is motivated by our study of zero-sum stochastic differential games $\backslash\text{cite}\{PZ\}$, whose value process is conjectured to be a semimartingale under a class of probability measures. As a by product, we establish some a priori estimates for doubly reflected BSDEs without imposing the Mokobodski's condition directly.

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