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The play operator, the truncated variation and the generalisation of the Jordan decomposition

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Abstract

The play operator minimizes the total variation on intervals, $[0, T]$, $T > 0$, of functions approximating uniformly given regulated function with given accuracy and starting from a given point. In this article, we link the play operator with the so-called truncated variation functionals, introduced recently by the second-named author, and provide a semi-explicit expression for the play operator in terms of these functionals. Generalisation for time-dependent boundaries is also considered. This gives the best possible lower bounds for the total variation of the outputs of the play operator and its Jordan-like decomposition. Copyright © 2014 John Wiley & Sons, Ltd.

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