

# Data Processing Bounds for Scalar Lossy Source Codes with Side Information at the Decoder \*

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## Abstract

In this paper, we introduce new lower bounds on the distortion of scalar fixed-rate codes for lossy compression with side information available at the receiver. These bounds are derived by presenting the relevant random variables as a Markov chain and applying generalized data processing inequalities a la Ziv and Zakai. We show that by replacing the logarithmic function with other functions, in the data processing theorem we formulate, we obtain new lower bounds on the distortion of scalar coding with side information at the decoder. These bounds are shown to be better than one can obtain from the Wyner-Ziv rate-distortion function.

**Index Terms:** side information, Wyner-Ziv problem, Ziv-Zakai bounds, source coding, on-line schemes, scalar coding, Rényi entropy, Rate-Distortion theory

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