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Mira Gonen, Michael Langberg and Alex Sprintson*, spalex@tamu.edu. *On Error-Correcting Codes with Restricted Error Sets.*

In many practical settings, there is a need to design error-correcting codes that can handle a predefined set of error patterns. We focus on the problem of minimizing the required alphabet size for any specific instance of this problem. Our contributions can be summarized as follows. First, we present a general framework for the design of customized linear and non-linear codes with restricted error sets. Next, we show that non-linear error-correcting codes can outperform linear ones in certain instances of the problem. Next, we present a connection to the problem of constructing erasure codes with generalized decoding sets. Finally, we consider a variation of the problem which allows a small probability of decoding error, and relate it to an approximate version of hypergraph coloring. (Received August 17, 2021)