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*Recurrent extensions of positive self-similar Markov processes and Cramer's condition*

Let  $(X, \mathbb{P})$  be a positive self-similar Markov process that dies at its first hitting time of 0. In this work we study the existence and characterization of all positive valued self-similar Markov processes,  $\tilde{X}$ , that behave like  $(X, \mathbb{P})$  before its first hitting time of 0 and for which the state 0 is a regular and recurrent state. A such process  $\tilde{X}$  is called a recurrent extension of  $(X, \mathbb{P})$ . Our main result establishes that  $(X, \mathbb{P})$  admits a self-similar recurrent extension that leaves 0 continuously if and only if the underlying Lévy process satisfies Cramer's condition.