

# A ZETA FUNCTION FOR JUGGLING SEQUENCES

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(submitted paper)

We give a new generalization of the Riemann zeta function to the set of  $b$ -ball juggling sequences. We develop several properties of this zeta function, noting among other things that it is rational in  $b^{-s}$ . We provide a meromorphic continuation of the juggling zeta function to the entire complex plane (except for a countable set of singularities) and completely enumerate its zeroes. For most values of  $b$ , we are able to show that the zeroes of the  $b$ -ball zeta function are located within a critical strip, which is closely analogous to that of the Riemann zeta function.

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