

ON UNSTABLE ENTROPY AND PREIMAGE ENTROPY

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Abstract: Given a C^2 diffeomorphism, Ledrappier and Young have studied the entropy along different hierarchy of unstable manifolds and given a celebrated formula for it. For C^1 partially hyperbolic diffeomorphisms, we introduce a definition for unstable entropy using new measurable partitions, and obtain upper semi-continuity for it. By introducing the topological version of unstable entropy, we then obtain a variational principle. For general C^2 diffeomorphisms we also obtain upper semi-continuity and variational principle for unstable entropy along an invariant lamination under certain conditions. Our approach also applies to studying preimage entropy for noninvertible dynamical systems and several new results are obtained.