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Domain Coarsening on the Hyperbolic Plane JESSE RAFFIELD, Florida State University, HOWARD RICHARDS, Marshall University, PER RIKVOLD, Florida State University — In statistical physics, the Ising model is used to study systems that vary in application from sociology to condensed matter. With such a rich diversity of use, it has become one of the most studied interacting models. One of its less studied, but also very rich, variations is that of an Ising model that is embedded in the hyperbolic plane. The motivation for this study is to cast light on how systems of negative curvature behave; examples of such are coral growth and the propagation of the internet. The primary characteristic of the hyperbolic Ising model that we seek to study, is the action of domain coarsening using conserved-order-parameter dynamics. That is to say, we are in search of an exponent that determines the behavior of domain coarsening in the hyperbolic plane. Just as a Euclidean lattice requires a Euclidean metric, so too does a hyperbolic lattice require a proper metric of its own. To this end, two such representations are employed; the first is based in graph theory and is known as the "taxi-cab" metric while the second involves gyrovectors and analytical geometry. Using Monte-Carlo simulations in conjunction with each geometrical basis, the domain coarsening exponent is estimated to a reasonable degree and is found to be smaller than its Euclidean counterpart.

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