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Critical behavior of the XY model on fractal lattices MICHELLE PRZEDBORSKI, BOZIDAR MITROVIC, Brock University — There has been considerable interest in determining whether the universality hypothesis extends to systems which are of non-integer dimension or to systems which are scale invariant (fractals). Specifically, research into these types of systems is concerned with determining the relevance of topological properties to their critical phenomena. We have performed Monte Carlo simulations for the XY model on three fractal lattices with different topological properties: the Sierpinski pyramid, Menger sponge, and Sierpinski carpet (which underwent unusual Berezinskii-Kosterlitz-Thouless transition). We will discuss the details of our results and show that while some properties, such as the order of ramification, are important in determining the critical behavior of these structures, the fractal dimension is not.

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