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Diffusive Phase Change Model of Twitter Information in the Context of a Cusp Catastrophe. KEITH ANDREW, MORGAN TAYLOR, Physics and Astronomy, Western Kentucky University, KARLA ANDREW, Cyber Defense Laboratory , PHILLIP WOMBLE, Physics and Astronomy, Western Kentucky University — For large sample populations social media information transmission can statistically obey patterns that can be modeled as diffusive wave phenomena. In particular Twitter messaging provides limited character range full searchable data sets with links provided by various hashtags and retweets. The complexity of the interconnectivity of the links can be expressed through a nodal graph and its equivalent matrix representation. Often the overall group Tweeting behavior in this representation is smooth and continuous over a large range of time scales, however some events can occur that lead to discontinuous changes in Tweet/Retweet behavior. Following Johnson we model this behavior as a phase change from one type of tweeting activity to another. We use the standard cusp catastrophe as an example of phase change behavior with two control dimensions. The potential function can exhibit first and second order phase transitions as described by a generalized Ginzburg-Landau motivated model. Here we identify the parameter space for a Tweet invoked phase transition corresponding to a sudden change in retweets. We identify the classical phase change critical curve and map this to the cusp catastrophe by taking the phase diagram as the projective base space of the cusp. .

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