Coupled ODEs Model for the Collision Process of Barchans

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We construct coupled ODEs model to describe the collision process of barchan dunes under a few number of basic mathematical and phenomenological assumptions. Using the model the transition between the coalescence and the recombination of two barchans depending on their initial sizes is discussed, and we show that this simple model supplies us with a new viewpoint to mathematically understand the underlying complex process. Moreover, the possibility of the extension of the model to that applicable in more general situations is discussed giving several examples.