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Battling Bluetongue and Schmallenberg virus: Local scale behavior of transmitting vectors.

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Bluetongue is an insect-borne viral disease that affects ruminants, primarily sheep, cattle and goats, caused by the Bluetongue virus and transmitted by biting midges. Bluetongue outbreaks have a huge economic impact, and the cost of outbreaks in the Netherlands in 2006 and 2007 alone has been estimated to around 200 million euros. Over the last decade, Bluetongue virus have spread northwards from the Mediterranean area. Initially this was ascribed to climate changes, but it has since been realized that a major contributing factor has been new transmitting vectors, *Culicoides obsoletus* and *Culicoides pulicaris*, which have the ability to acquire and transmit the disease. Recently, Schmallenberg virus has emerged in Northern Europe, transmitted by biting midges as well. This introduces the virus into a new environment where measures have to be taken to monitor and prevent the disease, and little is known about the behavior of the vector in the presence of host animals. This paper presents an analysis of field study data for biting midges in the presence of sheep, using recently developed analytical techniques for spatio-temporal analysis. The results suggest how one can monitor diseases like Bluetongue and Schmallenberg virus locally around host animals by monitoring the vector, and estimates the relative disease pressure under varying meteorological conditions.