



Seminario Aleatorio

Sesión 338

Risk assessment of cloud to ground (CG) lightning strikes in urban and rural in Oklahoma

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Abstract

Lightning is a natural event that can cause severe human and financial losses. This work introduces a probability risk assessment of the occurrence of the cloud-to-ground (CG) lightning in urban and rural areas of Oklahoma. CG lightning, although not the most common type, is the most damaging. Previous studies have reported that urban areas experience an increase in the frequency of CG lightning events, during warm months. This increase poses serious threats to urban industries and electronic systems. Lightning strikes are point process in nature, although this quality has not been exploited in previous studies. We utilize a probability model for the spatiotemporal point process of CG lightning to estimate the risk of a CG lightning strike for a particular location and time. The data are discretized into small spatiotemporal cells (voxels), and then, we fit a generalized additive model with a complementary log–log link function using the location and the day of occurrence of the strike as explanatories. On the basis of this model, we compared the urban and rural monthly fitted rates of CG lightning strikes. We found that the rate in the rural area is smaller than the rate in the Tulsa metropolitan area during the warm months; however, it is larger than the rate in the Oklahoma metropolitan area during May and June.

Viernes 29 de marzo de 2019, 13:00 hrs.
Aula 210, Plantel Río Hondo

El Seminario Aleatorio está destinado tanto a profesores como a estudiantes, por lo que el Departamento de Estadística agradece a los profesores que colaboren invitando a sus alumnos a estas sesiones.

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