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**Melinda Kleczynski\*** (mkleczyn@udel.edu), **Chad Giusti** and **Jeffrey Buler**. *Topological Detection of Roost Rings from Weather Surveillance Radar*. Preliminary report.

Weather surveillance radar provides information frequently, over long periods of time, and over large geographic areas. We can gain important ecological insights from this comprehensive data source, which has the capacity to document large-scale occurrences such as biological aggregations. This requires identifying biological activity in surveillance data collected for another purpose (weather forecasting). Here we focus on detecting groups of certain bird species leaving their roosts by using the ring-like structures this forms on radar images. Although black box methods are useful tools for detection and classification tasks, interpretable methods motivated by domain knowledge provide additional insight. Detecting ring-like structures is a major application of topological data analysis. A complication is that the aggregations of interest often present as partial rings, which are not identifiable under standard topological pipelines. We discuss our work formulating the problem to best detect the biological object of interest with the available mathematical techniques. (Received January 17, 2022)