

## **First-Look Analysis of EclipseMob Crowdsourced Data Collection**

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EclipseMob has conducted a collaborative effort to crowdsource a geographically distributed measurement of the effect of the August 2017 total solar eclipse on low frequency (LF) radio wave propagation. 150 do-it-yourself antenna and receiver kits were distributed to citizen scientists in 31 states and 2 countries. The kits interfaced with a smartphone app, which performed software-defined radio tasks for the receiver such as analog to digital conversion and local oscillator signal generation; added GPS time and location stamps to the recordings; and allowed users to upload their recordings to EclipseMob's cloud storage. WWVB, an LF transmitter operated by NIST on 60 kHz out of Fort Collins, CO, was observed for the EclipseMob data collection.

This presentation will discuss first-look analysis of the EclipseMob dataset. Due to an error in the app-receiver interface, some recordings contain both ambient audio and the downconverted receiver output. This reduces the quality of the data, but in many recordings usable information was still present. A matched filter was used to isolate WWVB's marker frames, which occupy the first thirteen seconds and the last second of WWVB's minute-long time code. With this information, the geographical variation of the received signal strength of WWVB during the eclipse can be tracked minute by minute across the contiguous United States. This information is compared against baseline measurements performed by EclipseMob participants the day before and the day after the eclipse.