

**September 2017**

**M and X Flare Solar Flare Observations using the  
SuperSID Radio Telescope**

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**Introduction**

September 2017 had four days of significant solar activity which resulted in a series of M and X Class flares. These flares were recorded using the SuperSID radio telescope.

The SuperSID radio telescope [1] uses low frequency transmissions to bounce signals off of the ionosphere. The ionosphere becomes reflective when exposed to a solar flare. This results in higher intensity signals on the SuperSid output.

After exposure to a flare the ionosphere takes time to recover. This recovery time results in an exponential downward slope from the peak intensity to the normal intensity level before the flare. This signal characteristic is known as a shark-fin. Both the M and X Class flare show significant shark tails. In fact the X8.5 flare resulted in a tail that lasted for multiple hours!

**Flare Characteristic Summary**

Solar flares are characterized from the smallest (A-Class) to the largest (X-Class). Each class increases by 10 times the level of the lower class. After the A-Class, there are B, C, M and then X-Class flares. Within each letter class there is a finer scale from 1 to 9. [2]

**Observations**

The Deep Space Exploration Society [3] maintains a SuperSid radio telescope in Colorado Springs, Colorado. The data was collected and analyzed using the SIDGRABBER [4] program. Figures 1 and 2 show two days of M-Class flares while figures 3 and 4 show 2 days of X-Class flares.

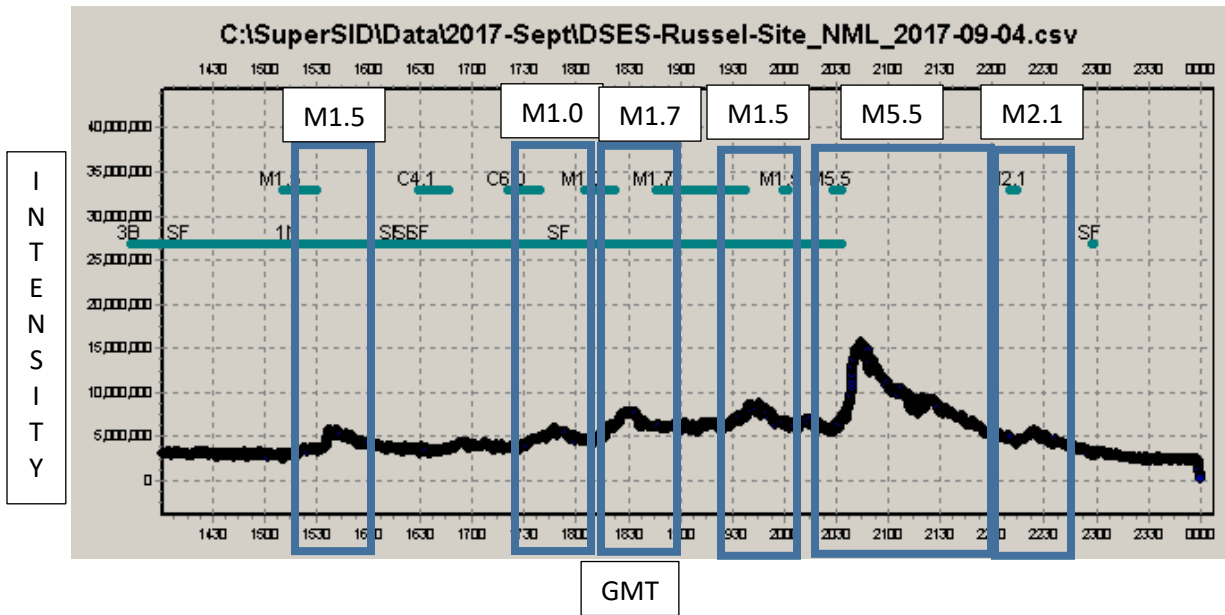


Figure 1: September 4, 2017 M Class Flares

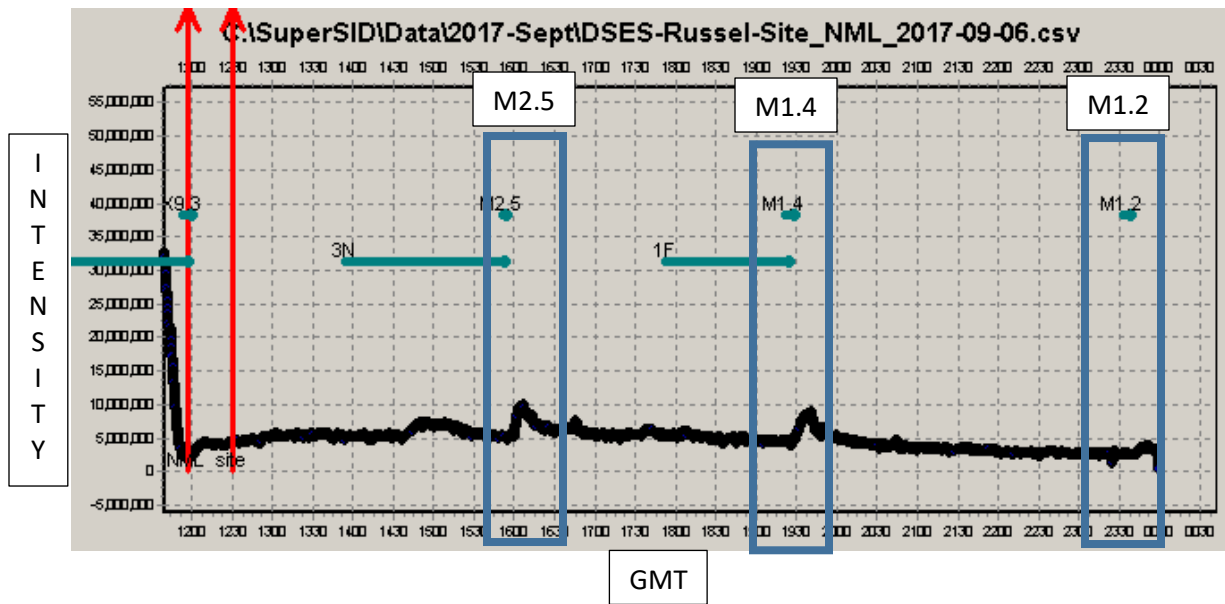


Figure 2: September 6, 2017 – M Class Flares

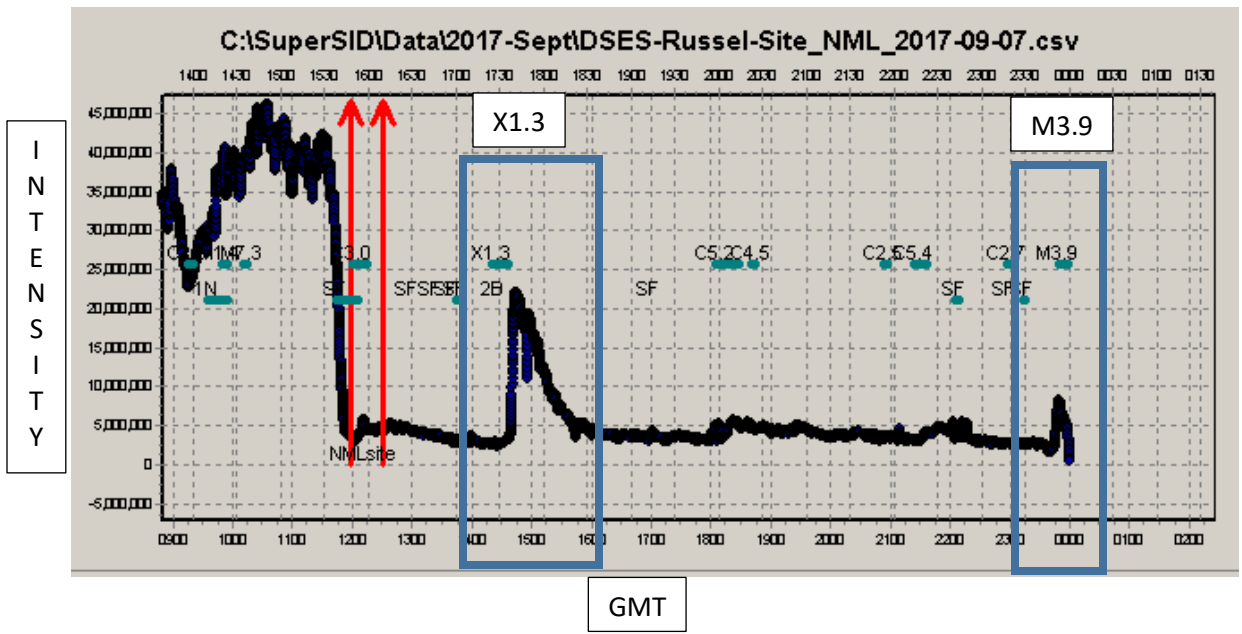


Figure 3: September 7, 2017 X and M Class Flares

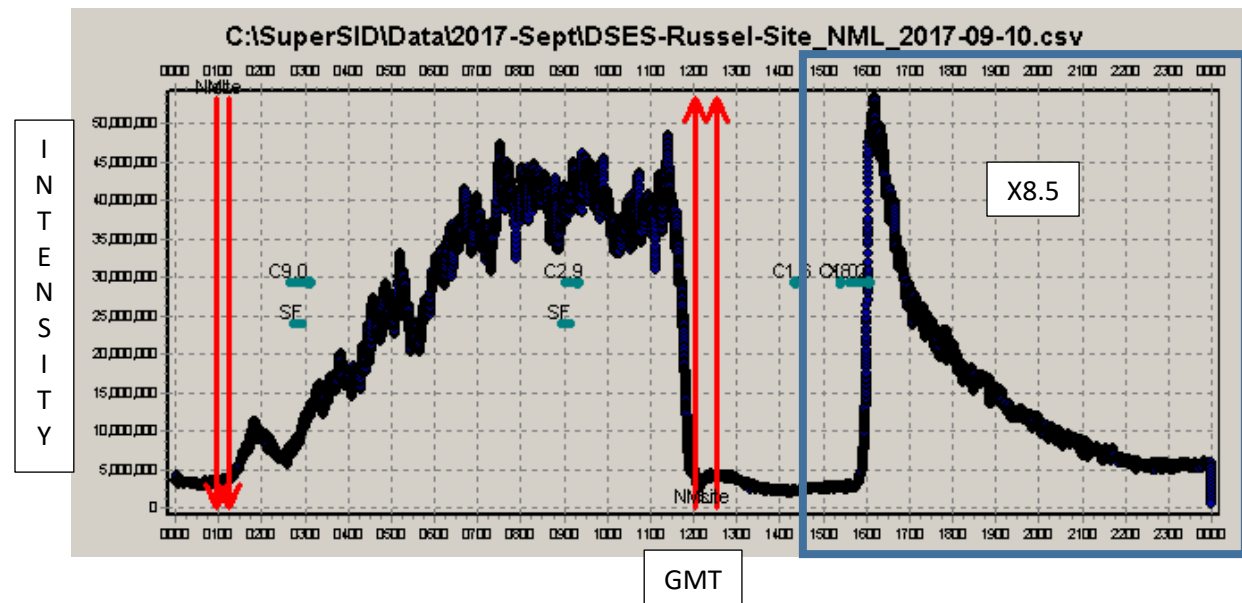


Figure 4: September 10, 2017 X8.5 Class Flare

## Summary

The September 2017 solar flare observations can be compared with other telescope observations to evaluate the effects of the M and X-Class flares.

## Works Cited

- [1] Stanford Solar , "SuperSID Manual: Space Weather Monitors," Stanford Solar Center, Stanford University, 2009.
- [2] "Solar Flares: What Does It Take to Be X-Class?," [Online]. Available: [https://www.nasa.gov/mission\\_pages/sunearth/news/X-class-flares.html](https://www.nasa.gov/mission_pages/sunearth/news/X-class-flares.html).
- [3] "Deep Space Exploration Society," [Online]. Available: DSES.Science.
- [4] "American Association of Variable Star Observers - SID Data Grabber," [Online]. Available: <https://www.aavso.org/category/tags/sid-section>.