

## Flare Archive Entry

November 2021

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**Name of Flare\*\*:** Flare 302-2 BH

**Flare Date:** 2012-09-27

**Flare Peak Time (in UTC):** 17:20

**Flare Start Time (in UTC):** 16:00

**Flare End Time (in UTC):** 18:30

**Flare Peak Irradiance (in  $\text{W/m}^2$ ):**  $6.38\text{e}+6$

**Flare Class:** C

**Flare Total Energy (in ergs):**

$2.2220889661595984\text{e}+28$  ergs

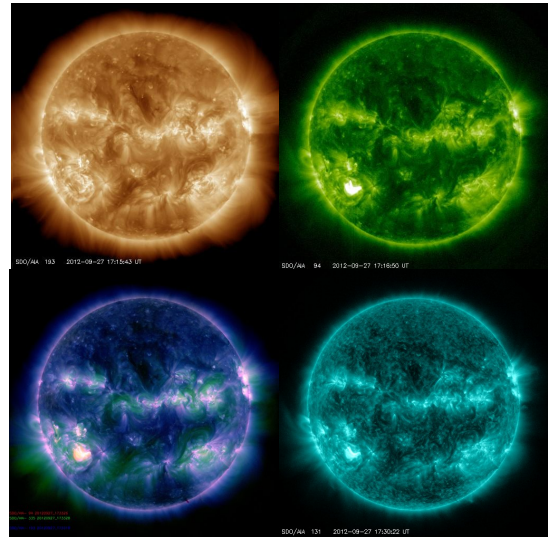


Figure 1-4

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## Flare Analysis

### Description of the flare

Our flare is surprisingly isolated from its neighboring flares in its timeline. There is a good span of time before and after the sun experiences another solar flare. That being said, our flare does experience a minor solar flare of much smaller class following the peak irradiance for our flare, resulting in the small dimple of energy in the exponential decline of the flare.

The flare 302-2 BH occurred on 2012-09-27, between 16:00-18:30 with a peak around 17:20, and was read by the GOES-15. Fittingly, we decided to name the flare "Flare 302-2" after our section and group number. The peak irradiance tops out at  $6.38\text{e}+6$ , indicating that this is a class C6 flare. The entirety of the flare is relatively clean. This translates information about the absence of significant pre-flare activity. Despite the end of the flare having a small imperfection in its rate, the beginning and end of the flare stand out prominently. With 2012 being the beginning of a solar maximum, it is expected to have the indication of other flares in the background.

### Background correction

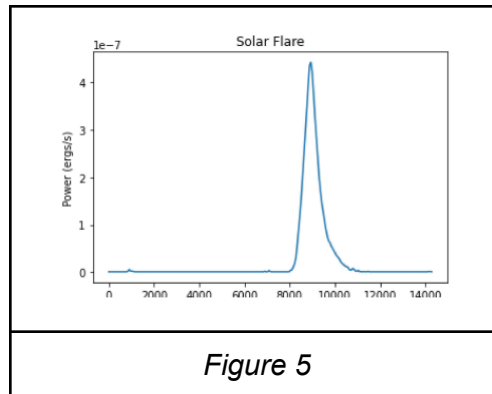
The process that we used for the background correction was to first plot the pre-flare data. We found very tiny peaks that we were unable to see without zooming in. After plotting the data, we isolated the pre-flare data and found the average of the baseline using NumPy math libraries. The background correction was  $1.1070821163846125\text{e}-09$  which is extremely small.

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### Finding start and end times

The start and end time of the flare was calculated by choosing a spike in the graph that had clean data before and after the spike. In other words, the line should not have any significant bumps that could hinder the data. As shown in Figure 2.



### Discussion of total energy of the flare

The total energy that was calculated for the flare was  $2.2220889661595984 \times 10^{28}$  ergs. Looking at the classwide data our data was in the middle of the dataset. Compared to other values, the data is close to the medium.