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Question 3: Do the data conform to the assumptions of the Poisson distribution?

Perhaps I am taking the wrong approach to this, but I do not think solar flare data conforms to the assumptions of the Poisson distribution for a few reasons. First, is the assumption of a constant λ . The solar cycle is a well-known phenomenon, and therefore there are times when there will be greater or lesser solar activity, and hence fewer solar flare counts. Even during solar maximum, the rate is not constant, and will ebb and flow with the presence or absence of active regions. Moreover still, some active regions are more productive than others, and even a single active region likely doesn't have a constant rate of solar flare production.

There is also the assumption that events will happen in a certain interval. This is not the case with solar flares. This is of course related to the constant λ assumption, which stated above, does not apply. Solar flares can happen in close intervals or long intervals. There is no known regular timing. Even if solar flare events are not independent, the relation between one event and another is complex, and possibly involves some other magnetic instability.

For these reasons, based on my knowledge of solar flare frequency, I do not think the solar flare data conforms well to the assumptions of a Poisson distribution.