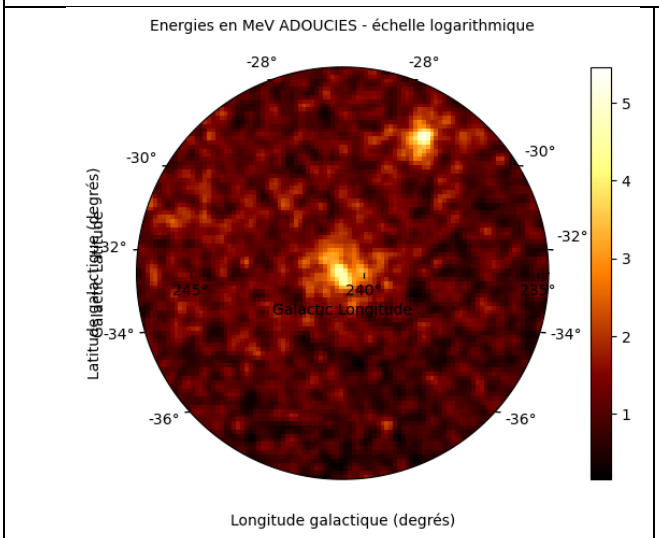
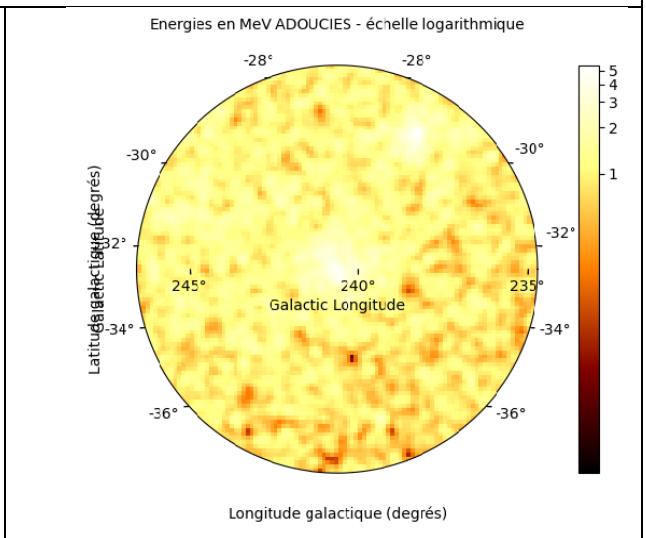
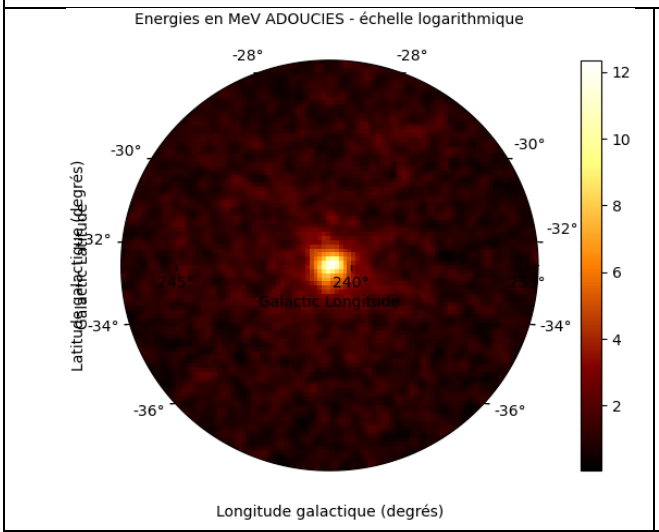
AGN1 : VIZUALISATION

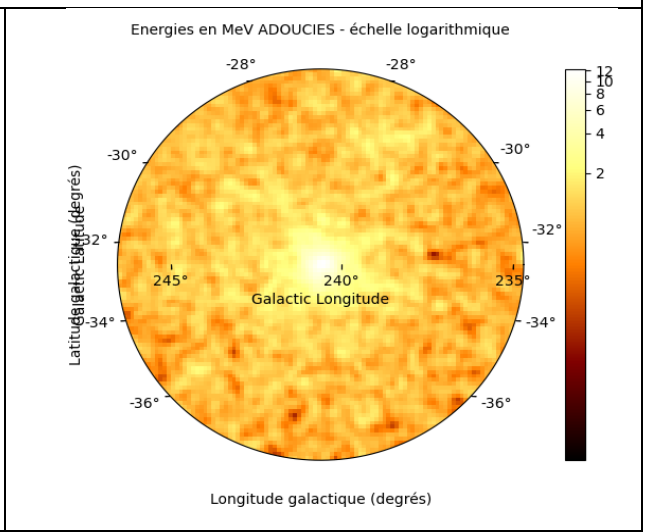
Periode1



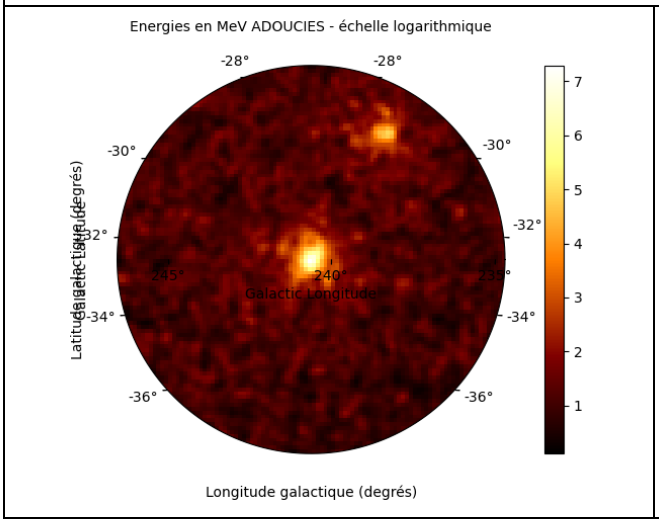


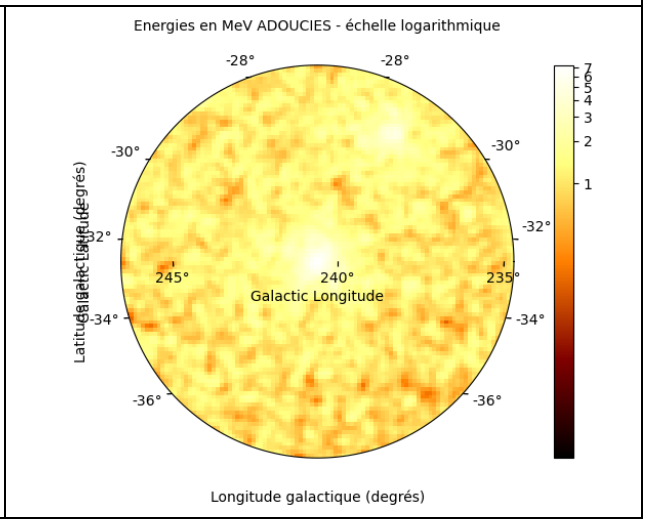
Periode2





Periode3



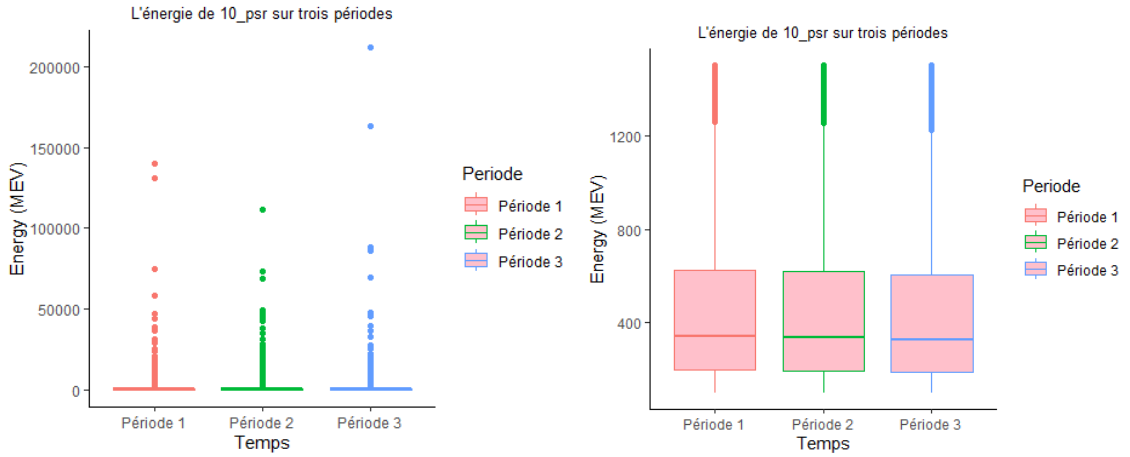


PSR number 1 is the PSR with the highest energy among the 3 PSRs in our area of the sky. Its coordinates are: L: 263.554 and B: -2.788.

```
 "Les statistiques de 10_psr :"
annee  moyenne nombre    somme ecart_type    marge borne_sup borne_inf
 2008 794.8615  30228 24027072   1842.825 20.77435  815.6358  774.0871
 2012 786.8216  32223 25353753   1702.476 18.58858  805.4102  768.2330
 2016 771.3796  32932 25403072   2092.312 22.59776  793.9773  748.7818
```

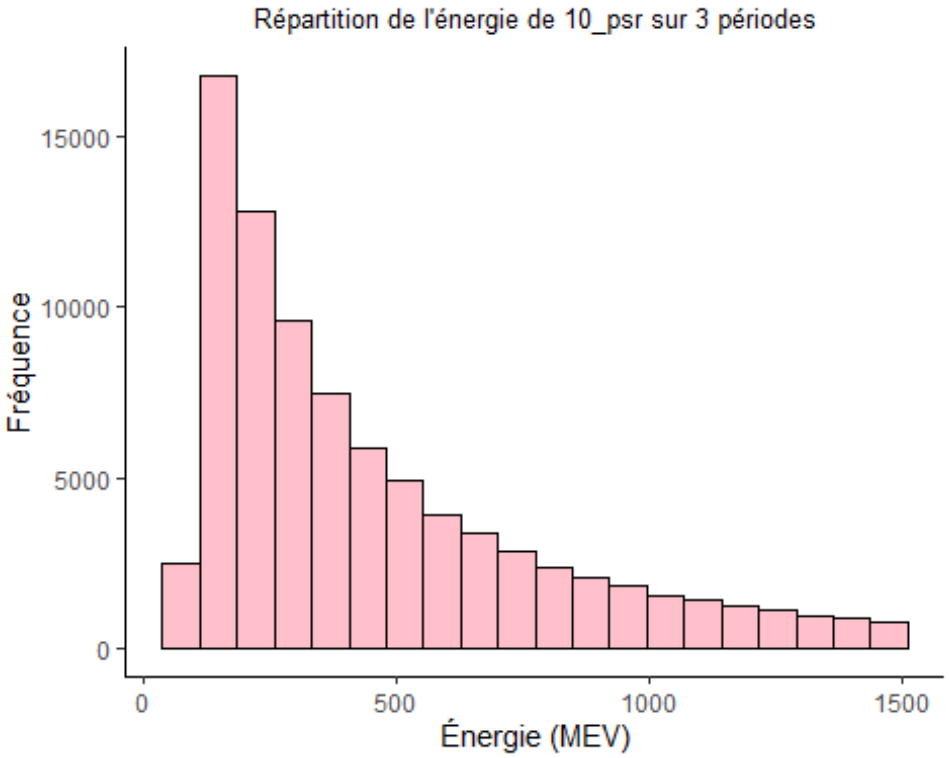
We observe an increase in the total number of detected photons, reaching a peak in 2016 with 32,932 photons. The total energy sum follows this trend, increasing from 24,027,072 to 25,403,072, indicating increased pulsar activity over the years. However, the average photon energy gradually decreases over the three periods, going from 794.8615 meV in 2008 to 771.3796 meV in 2016.

The standard deviation, which measures the dispersion of data around the average, significantly increases in 2016. This suggests greater variability in the measurements that year or possibly a period where the energy was less stable. We have two boxplot graphs, one of the population and the other of the sample for energy <1500.

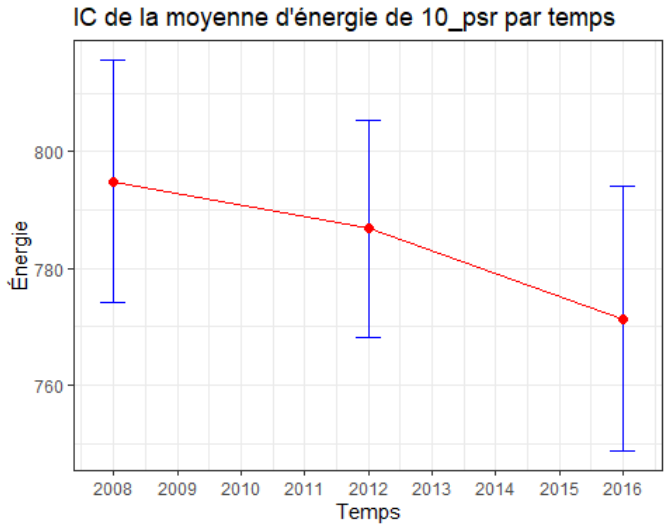


When examining the first graph, we notice that most of the photons are grouped towards the lower end. Indeed, the extreme values are far from the median and the third quartile (Q3). The third period presents more extreme values. This can influence the average and the total energy sum.

Now, moving to the second graph. Here, we can more clearly see the interval between the first quartile (Q1) and the third quartile (Q3) as well as the average for PSR number 1 across the three periods. However, there are no significant differences between them.



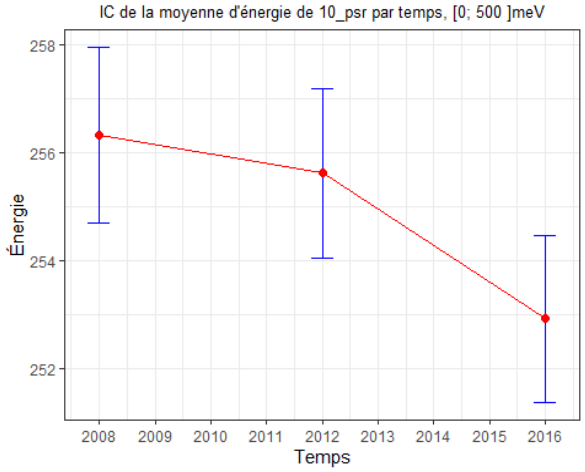
Next, when examining the histogram representing the total energy distribution over the three periods, we observe that most of the photons fall within the 0-500 MeV and 500-1000 MeV ranges. This is true for all the emitters we will analyze later, so we won't repeat this comment for the following emitters.

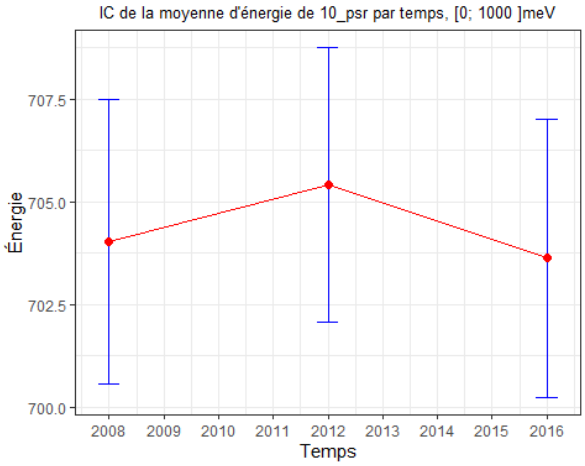


Overall, we can conclude that the energy of this pulsar tends to decrease year by year, and it may be becoming less stable, as suggested by the increasing standard deviation over time.

```
 "Les statistiques de 10_psr [0; 500 ]meV :"
annee  moyenne nombre   somme ecart_type    marge borne_sup borne_inf
 2008 256.3233  17623 4517186   109.6267 1.618544  257.9419  254.7048
 2012 255.6187  19142 4893054   110.4092 1.564082  257.1828  254.0546
 2016 252.9259  19808 5009956   110.7638 1.542502  254.4684  251.3834
```

```
 "Les statistiques de 10_psr [0; 1000 ]meV :"
annee  moyenne nombre   somme ecart_type    marge borne_sup borne_inf
 2008 704.0283   6455 4544503   141.8779 3.461105  707.4894  700.5672
 2012 705.4008   6776 4779796   140.2550 3.339486  708.7403  702.0613
 2016 703.6241   6764 4759313   141.6910 3.376669  707.0008  700.2474
```





Looking at the energy interval [0:500] meV, we can confirm this trend as most photons are concentrated in this energy range. For the second energy interval [500:1000] meV, we see a slight increase in the average during the second period, but overall, there is a slight decline from 2008 to 2016.

We calculated the autocorrelation coefficient of the field = number: 0.3059