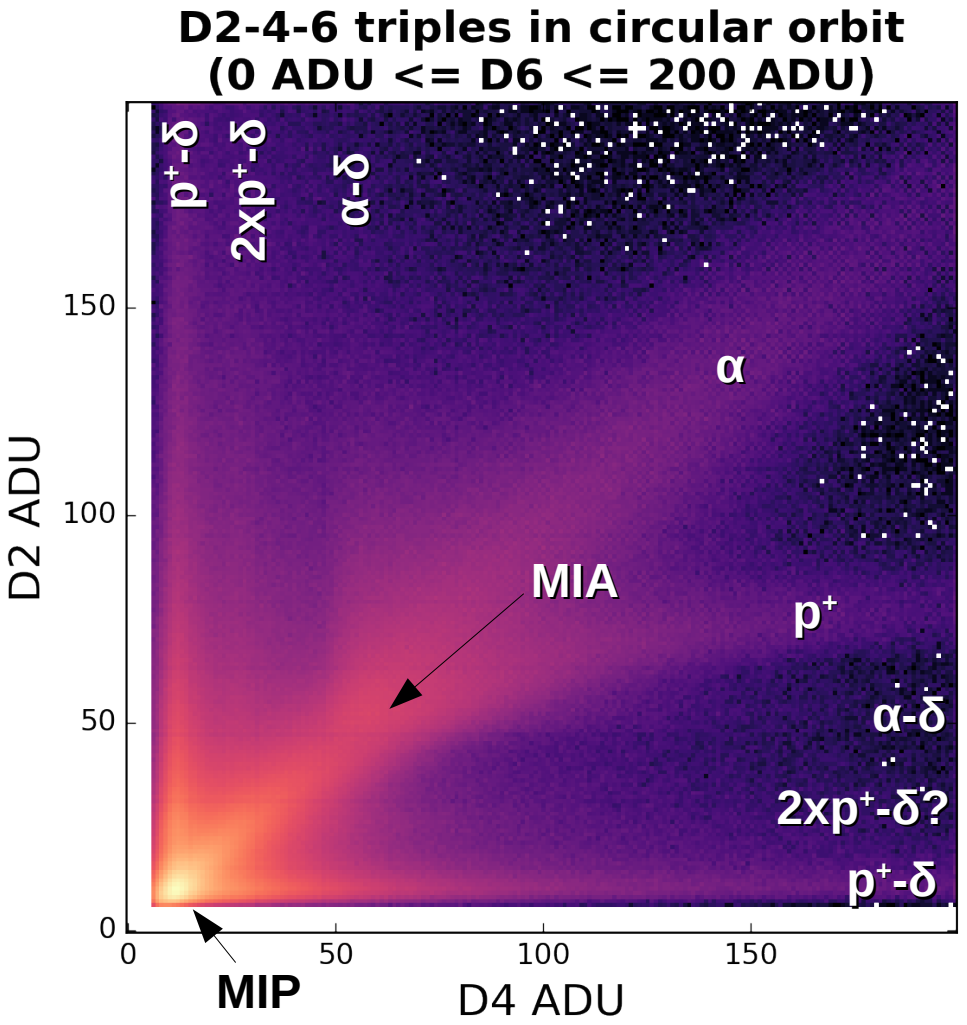
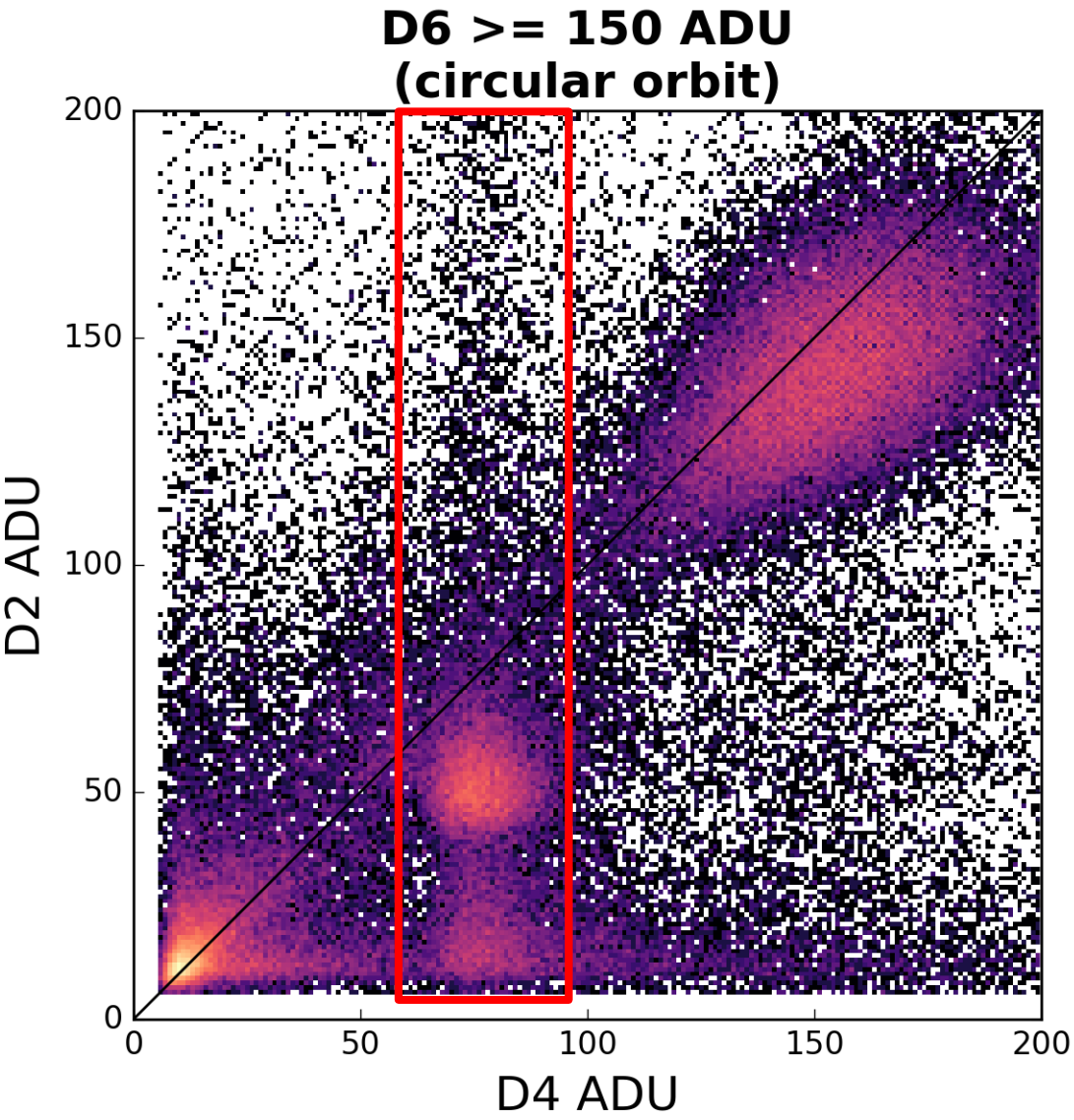
How to Identify Albedo MIPs:

Fahad and Wouter's modeling suggest that water ice could enhance albedo MIPs in the nadir viewing direction

Triples with
6 ADU ≤ LET ≤ 200 ADU

Subset of triples
shown at right

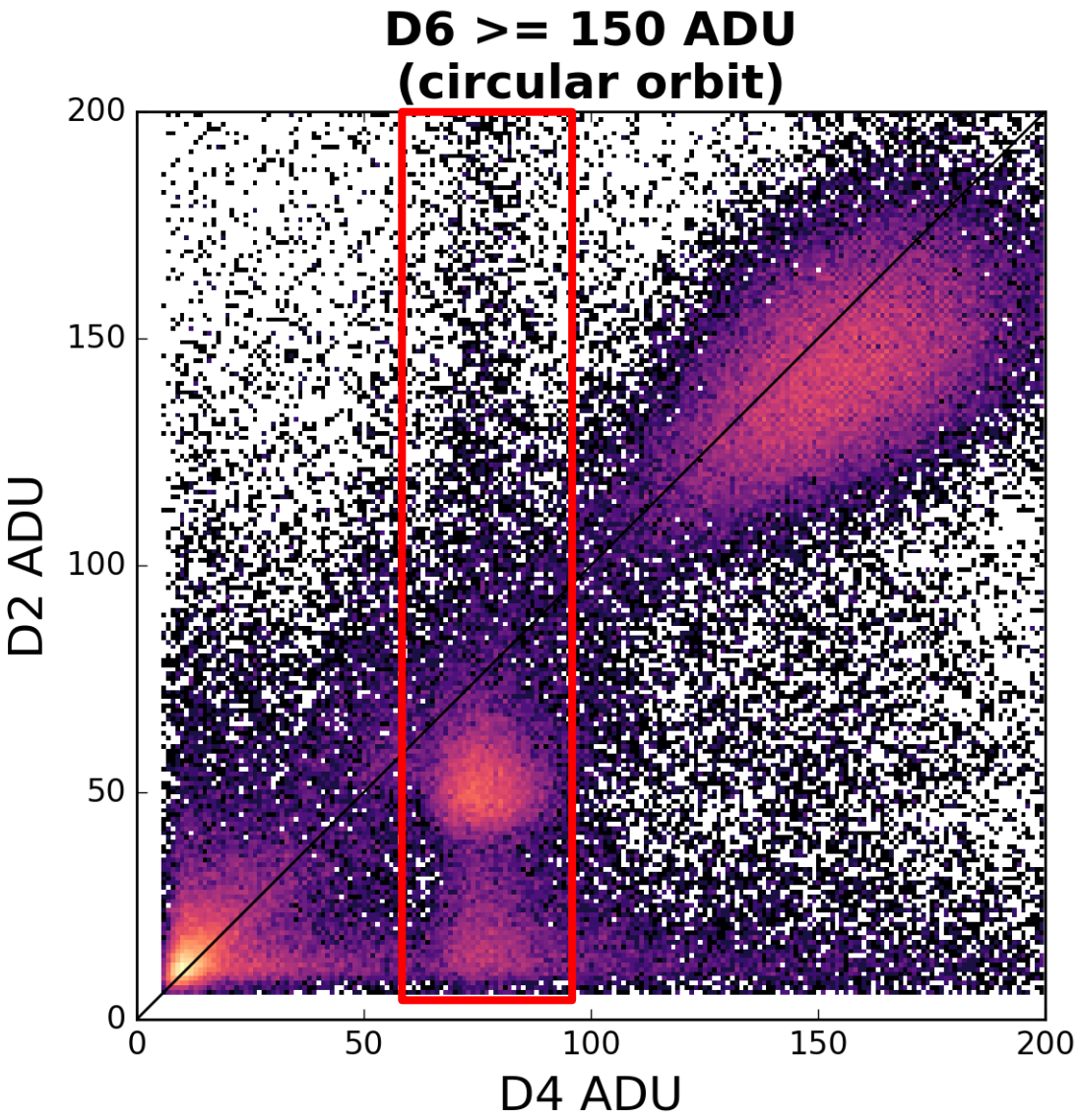


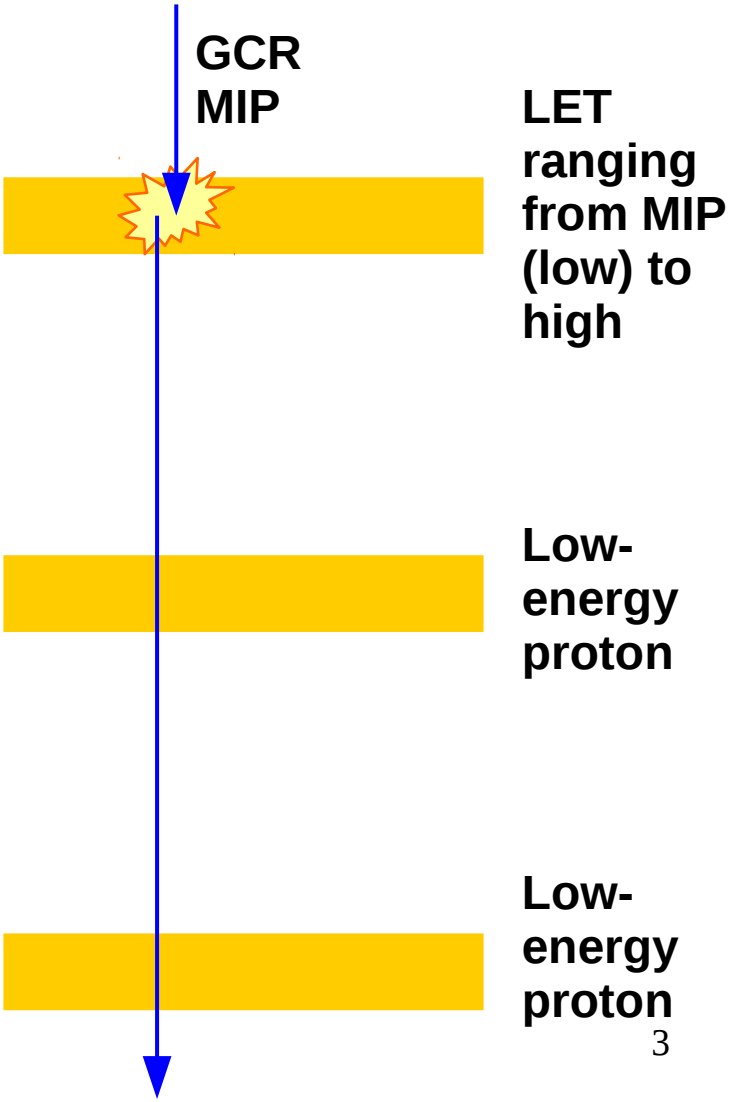


After discussing this with Wouter and Jody, we think we know what this plot shows. These are particles that are “anything” in D2, low-energy protons in D4, and thus probably low-energy protons in D6.

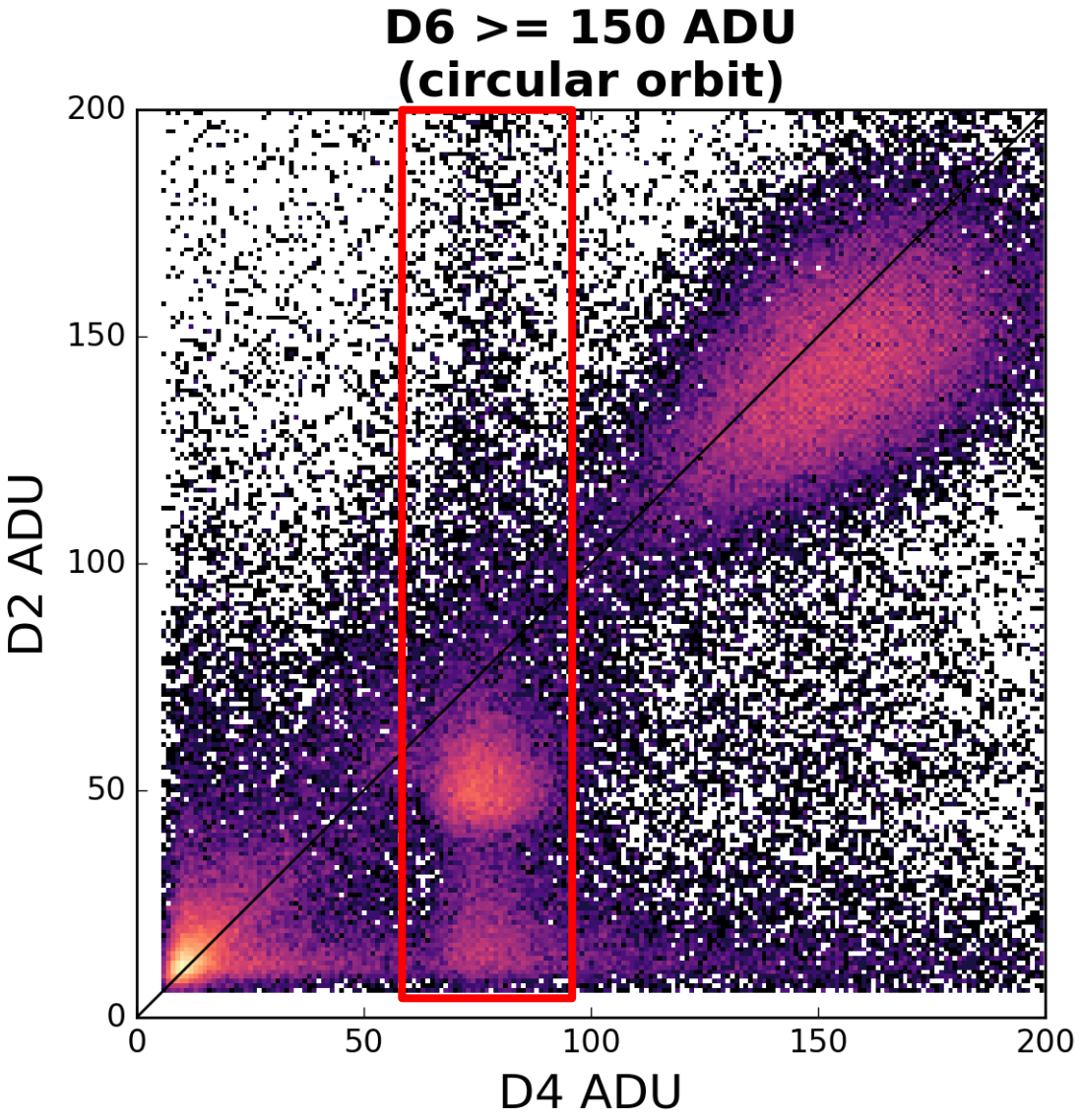
Wouter suggested that a GCR MIP collides with a nucleus in D2, increasing the LET in D2 above MIP energies. The MIP loses enough energy to be a typical low-energy proton on the D4-D6 GCR swoosh.

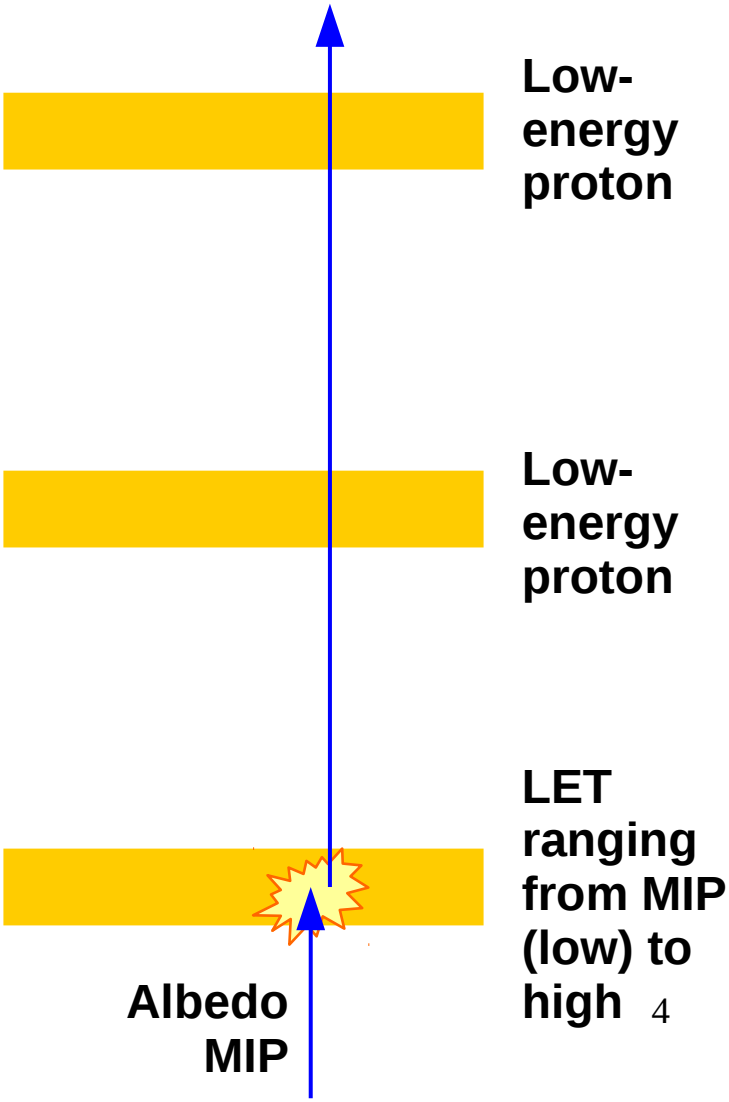
If a MIP collides inside D2, most of the energy released in the collision is contained in D2 (cartoon). But the collisions are more likely to occur towards the nadir end of the detector. This explains why so many events lie just above the δ-wing in D4 (~MIP LET in D2) and trail off at higher LETs in D2.





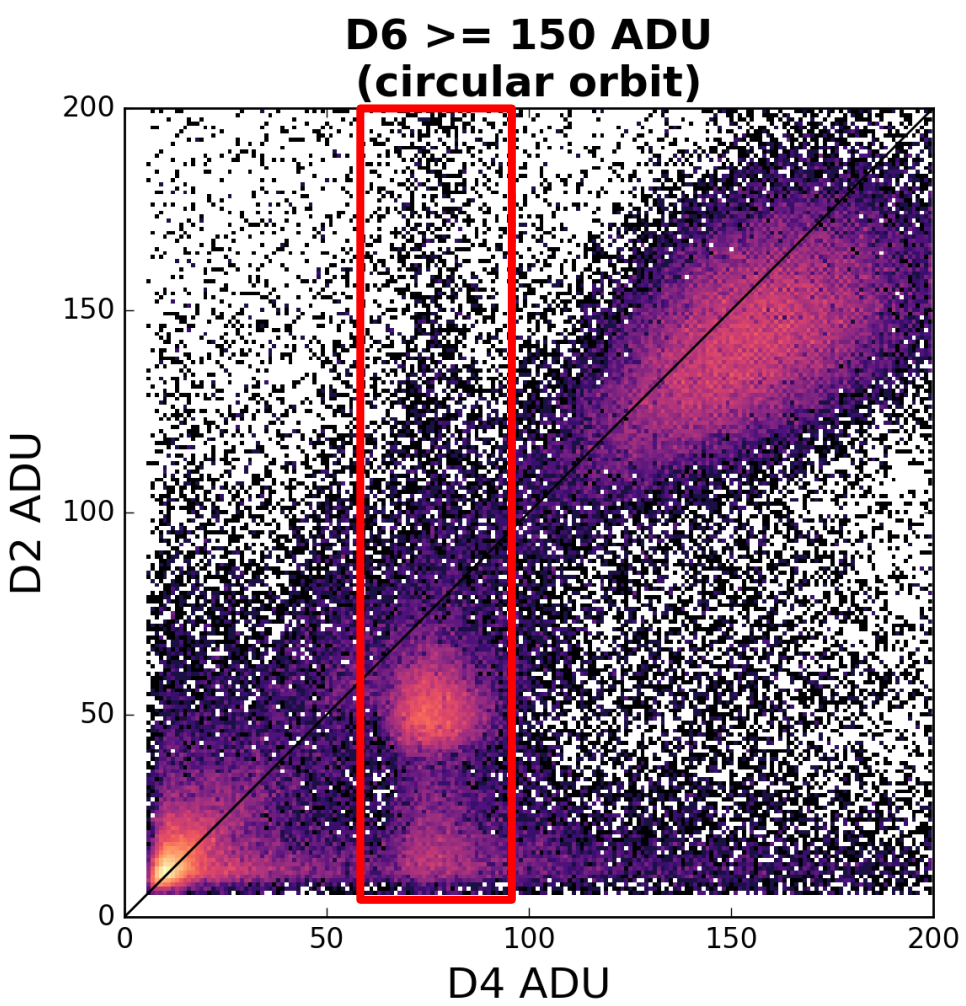
This could be the directional signal I was looking for! Is there a similar blob in the opposite direction (see cartoon)?



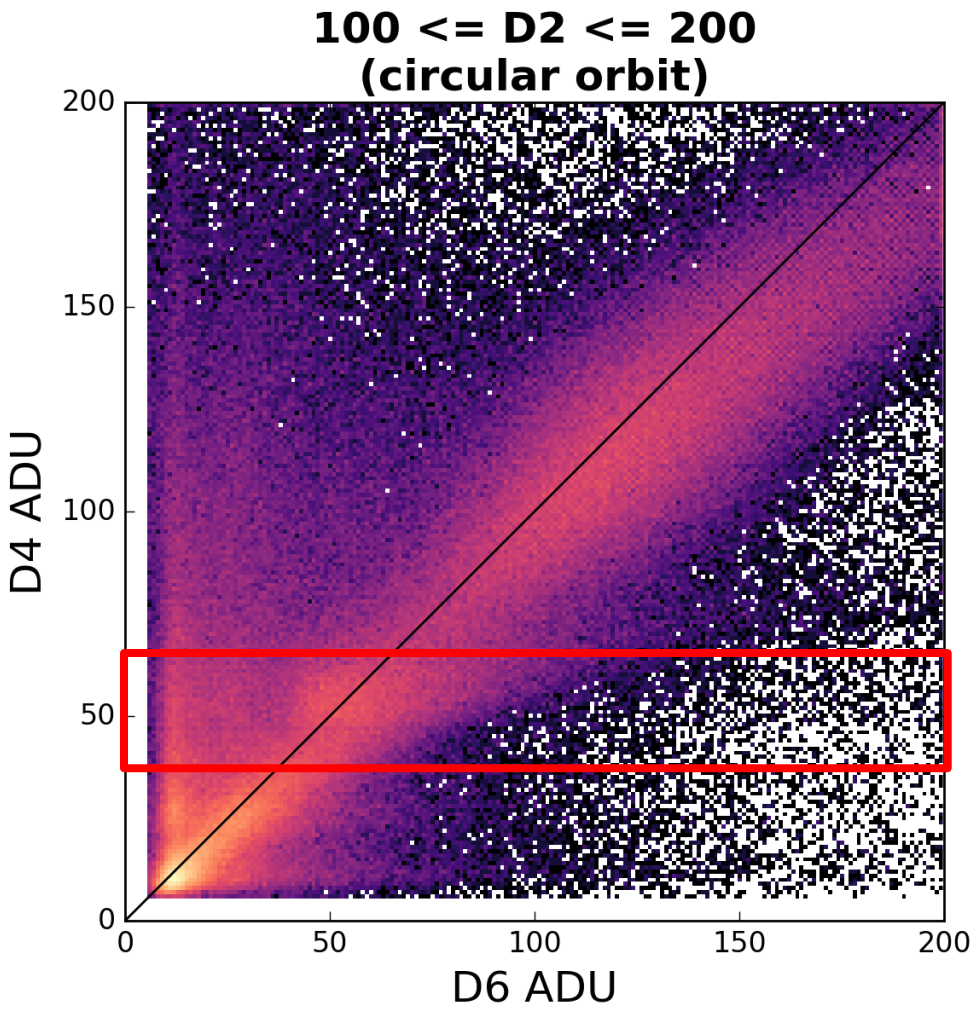


We should see it as a stripe in D6 (right), and there may be a hint of something.

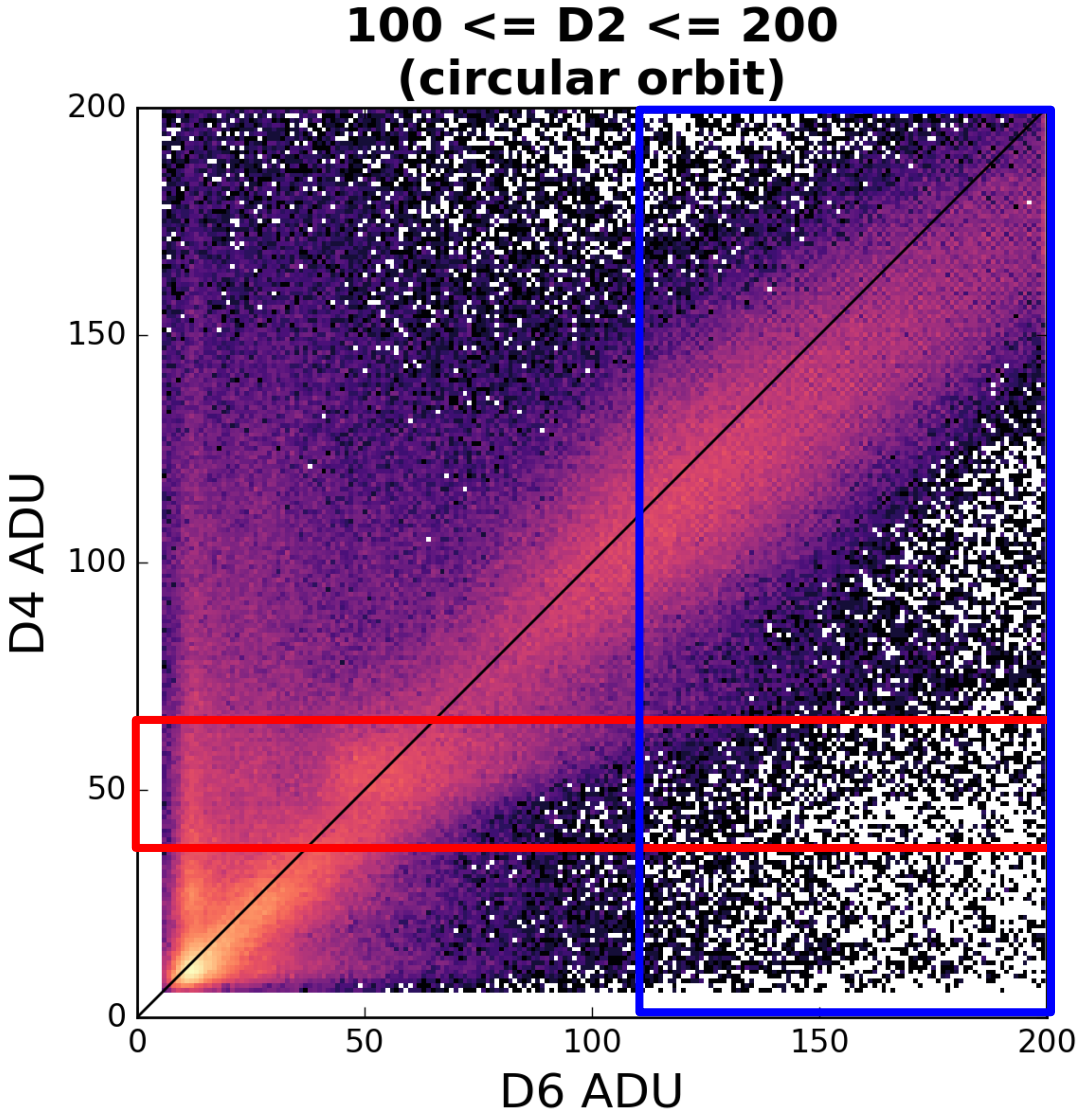
GCRs

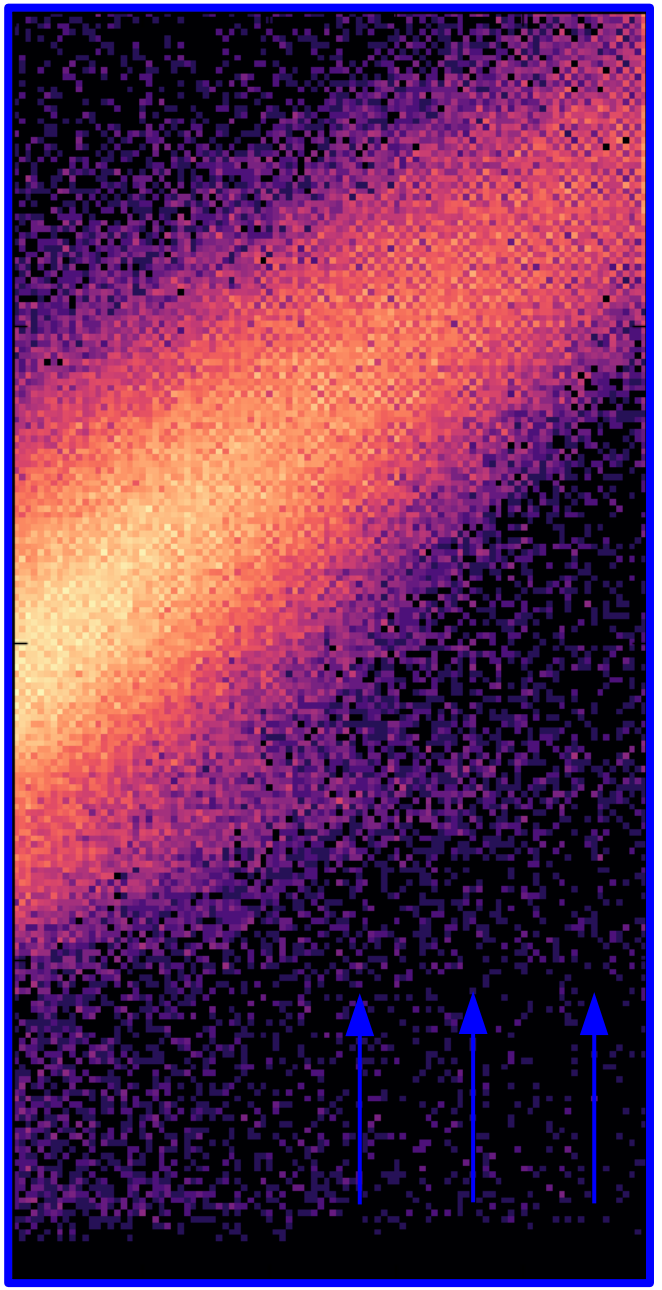


Albedo?



The blue box is shown at right, and there does seem to be something there.



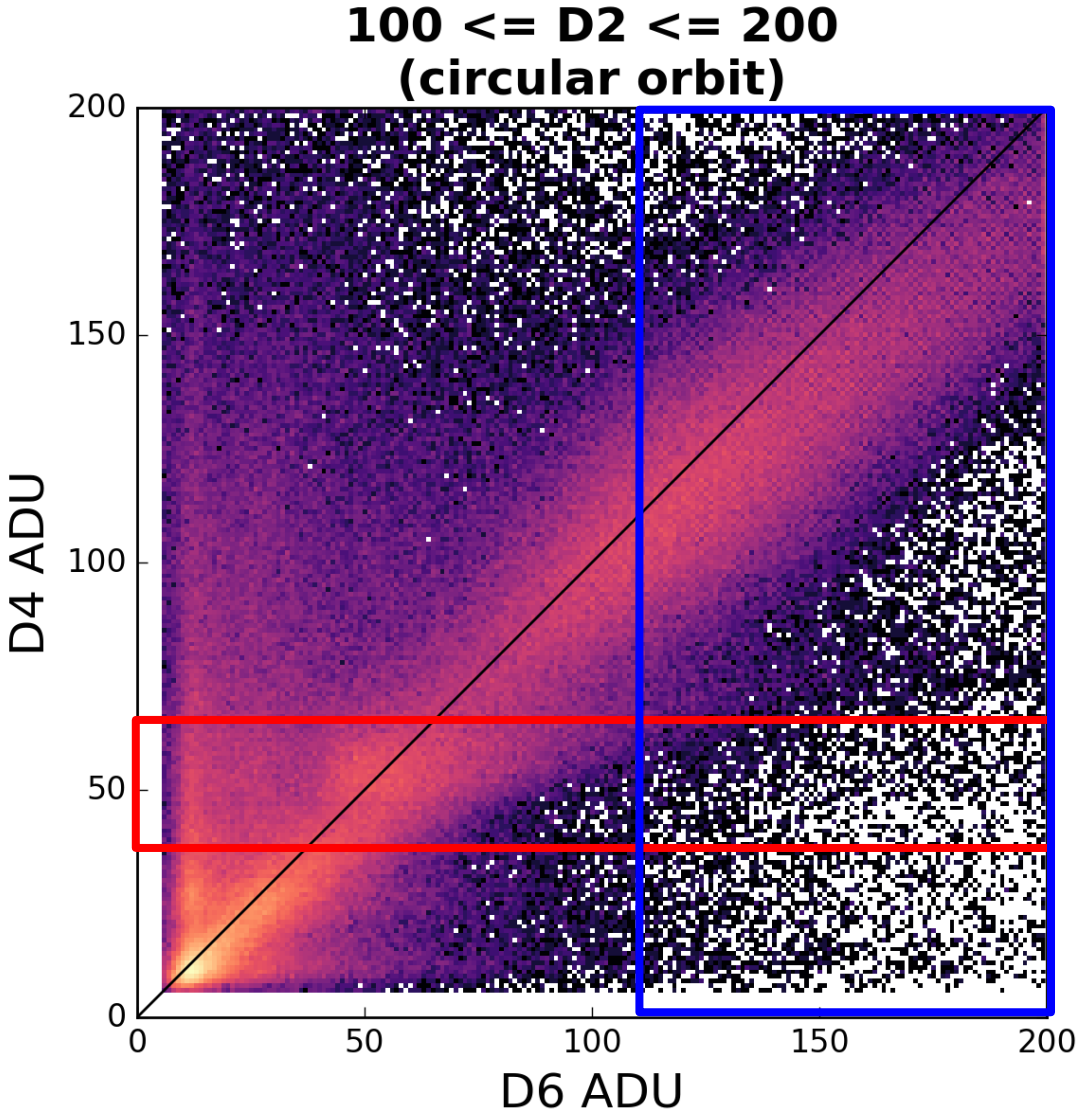


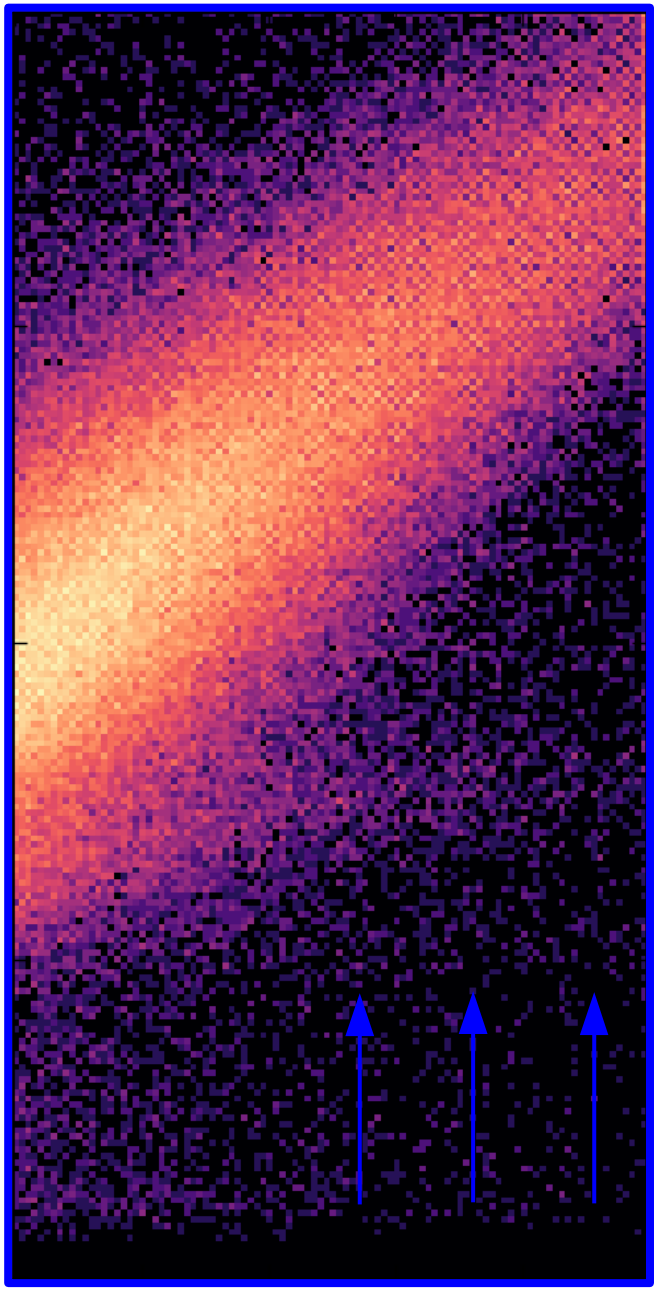
GCR alphas

GCR protons

Albedo MIPs

The problem is that there are only hundreds of counts in this region. So I'm going to take this all the way out the proton swoosh.



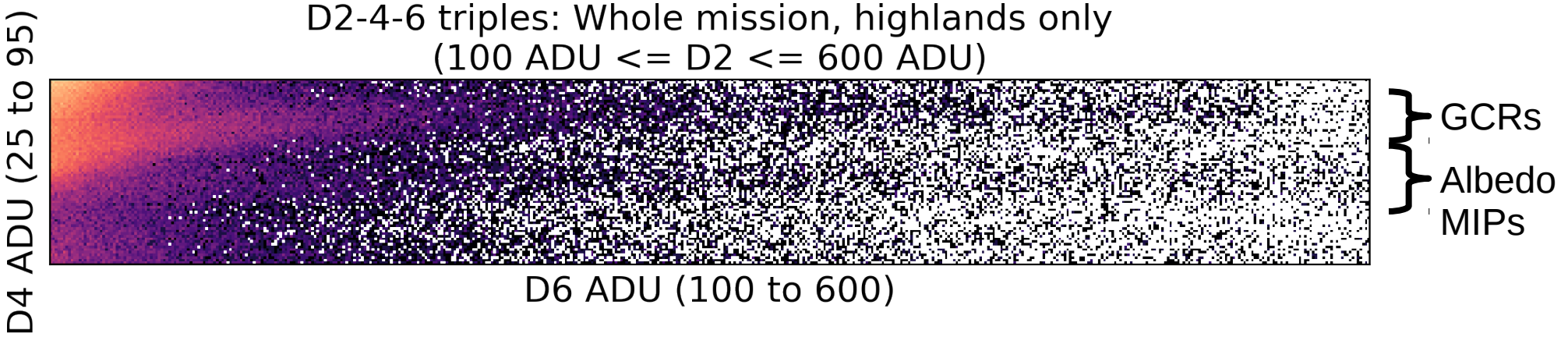


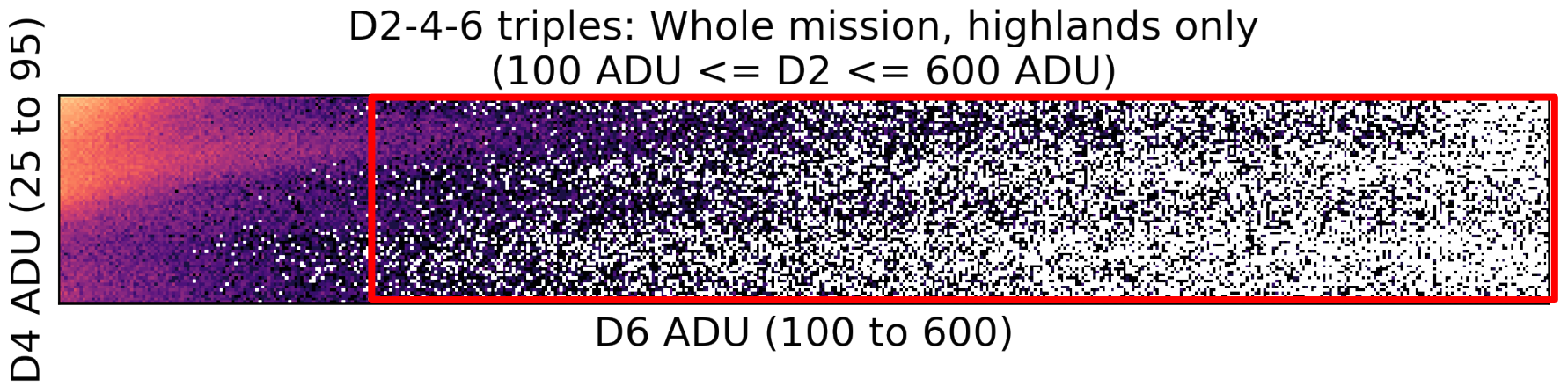
GCR alphas

GCR protons

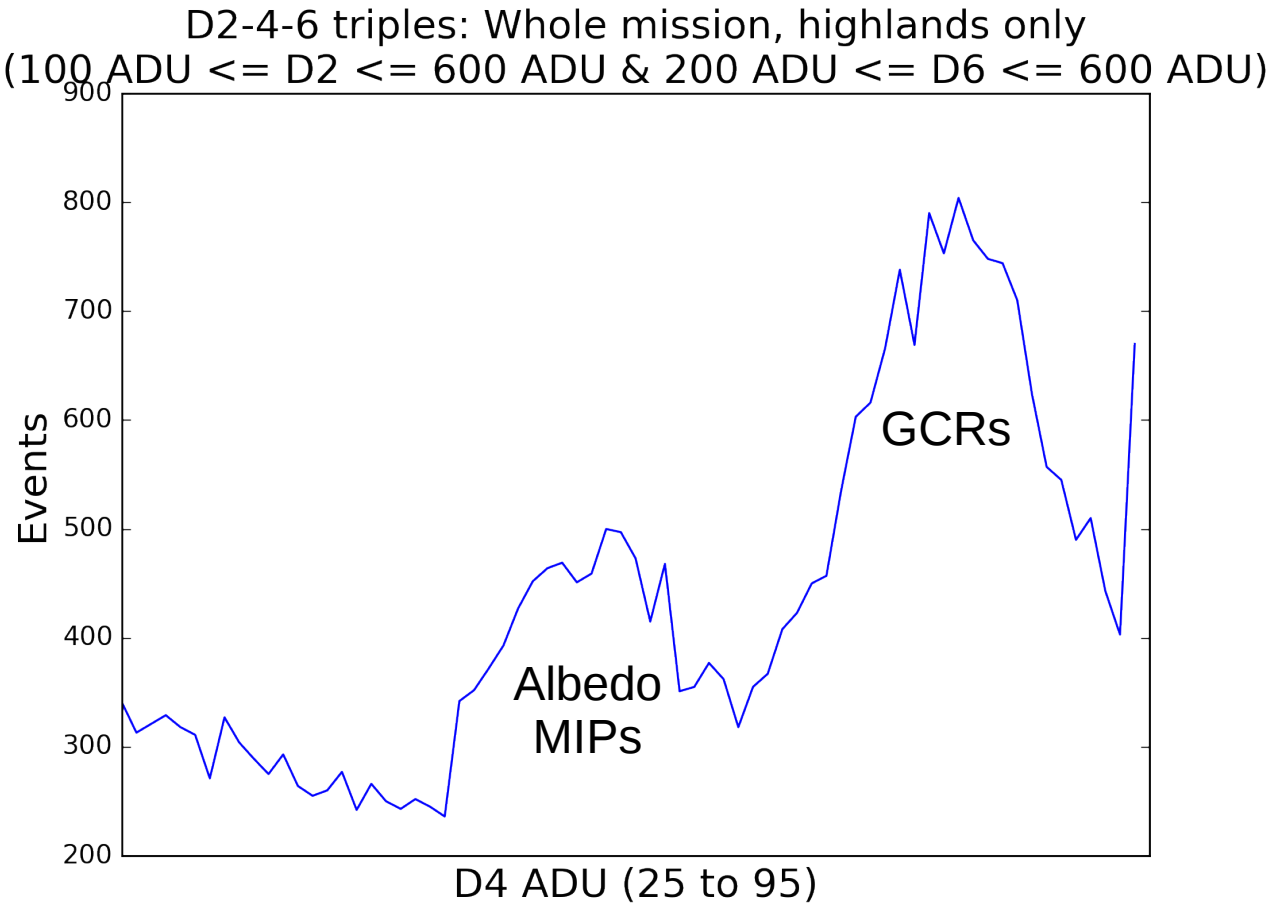
Albedo MIPs

Here's the whole proton swoosh for the whole mission (highlands only). The albedo MIPs are more obvious.

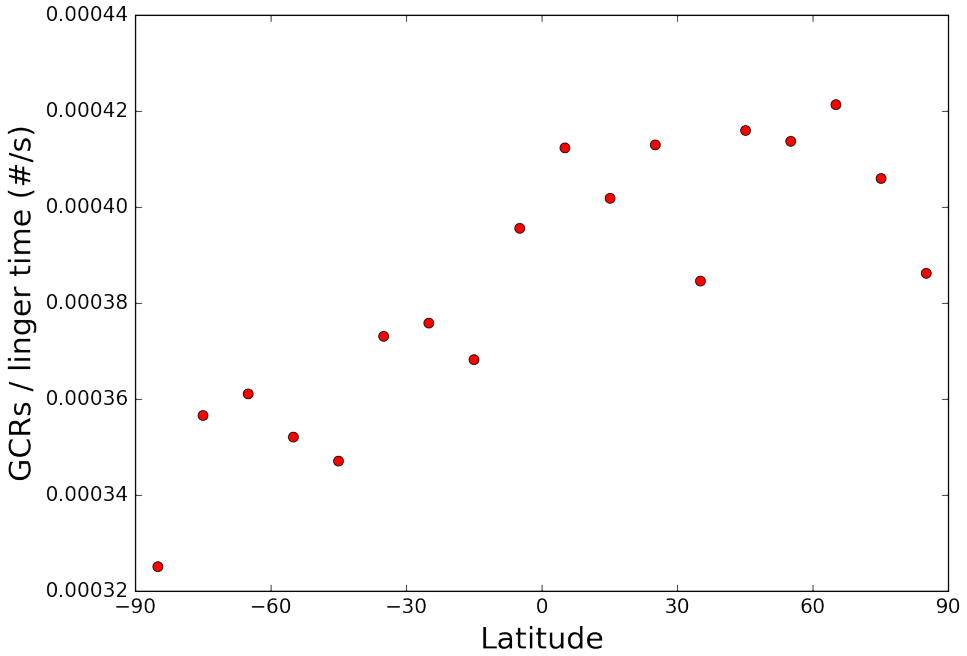


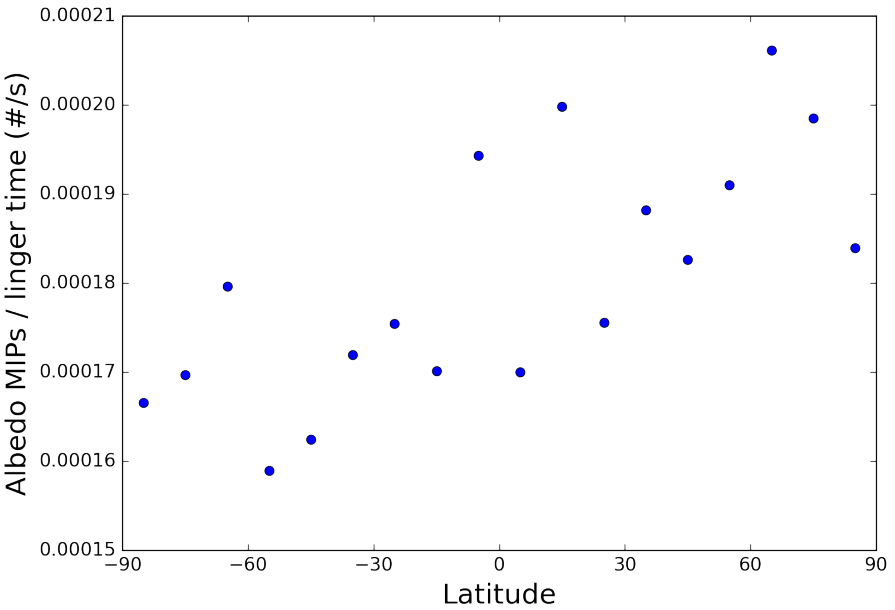


Collapsing part of this cross-plot (in red box) in D6 gives:



I can make poor man's plots of the latitude trend of both the GCRs and albedo MIPs by summing the appropriate D4 channels:





When LRO was in the northern hemisphere, it was usually farther from the Moon, so the GCR rates increased. This raised the background of the albedo MIPs, so they also show a latitude trend.

I would think that, if there were an abundance of AMIPs near the poles, it would still be evident in the plot on the right, e.g., as a “U” superposed on the trend.

Is it worth doing bump-on-scruff?