Condensation in Run 14

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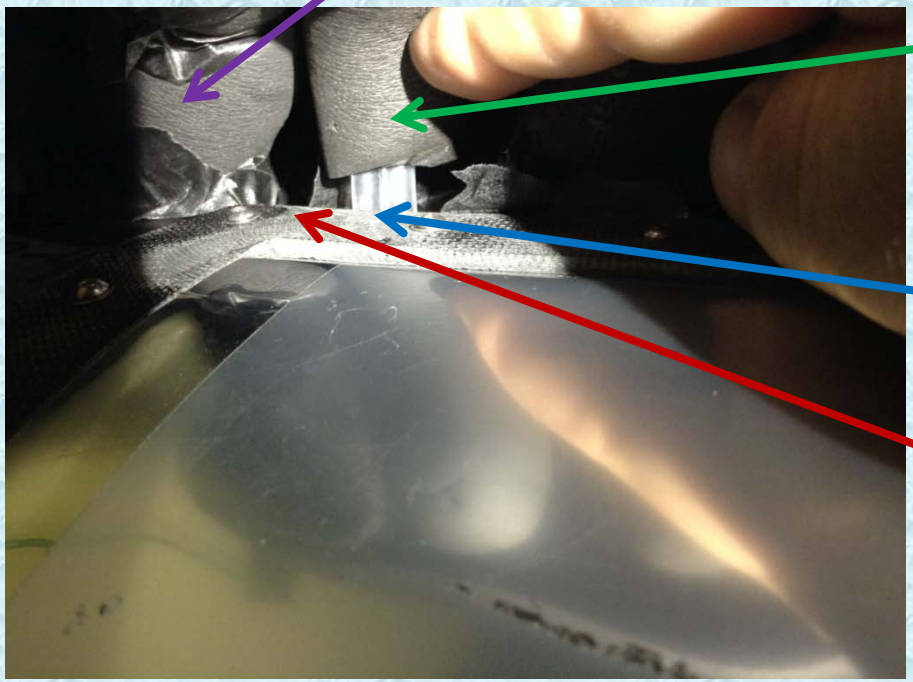
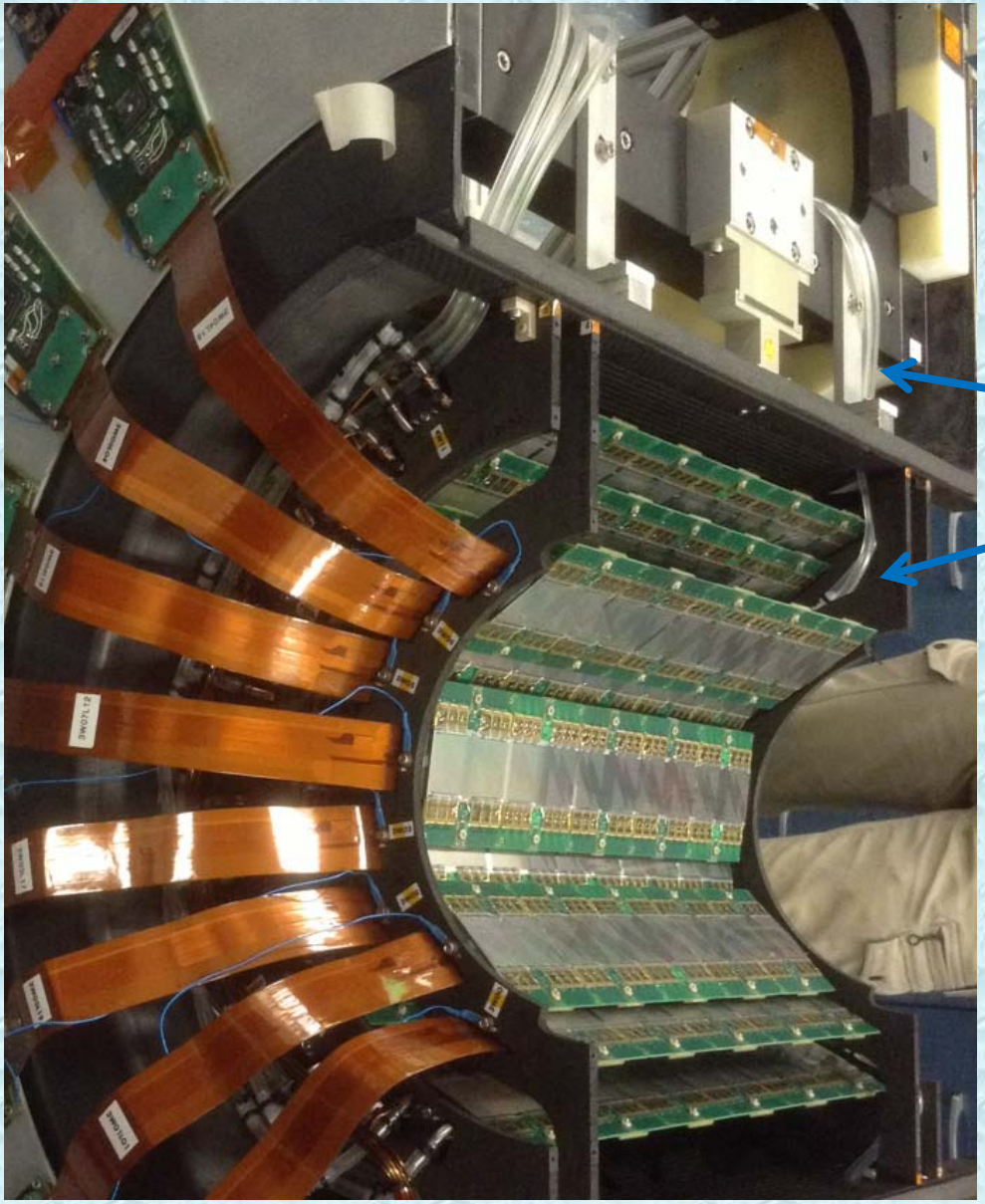
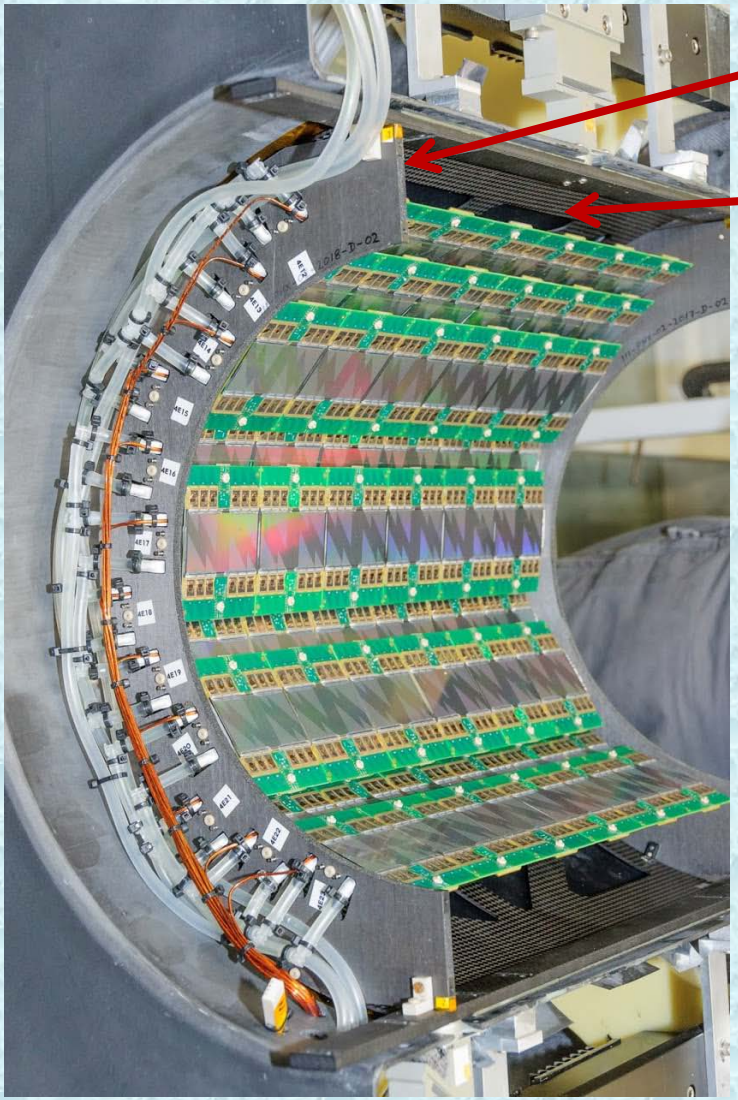
The exposed lines are the pair of tubes supplying Novec to the Strip Pixel inner barrel. Water was found condensing on them at the end of the run and dripping into the detector enclosure. Water was also found along the window frame in the same area. All lines below 10C were wet because of air gaps.





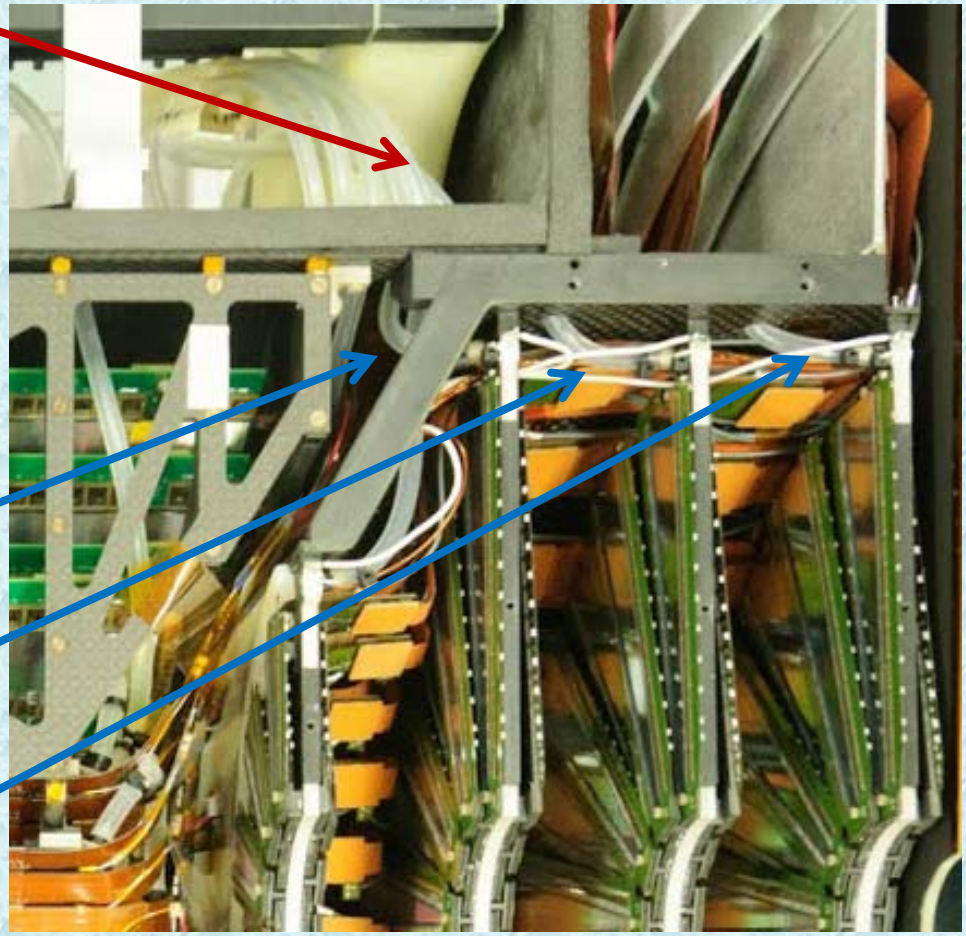
These are the lines shown in the first slide from the inside. As you can see, any water dripping in will drip directly on the strip pixels. These are the lines that feed the inner strip barrel.



Window Frame seal is behind the carbon frame. If water get in anywhere, it can drip from the edge of the carbon frame onto the back of the Strip Pixels.

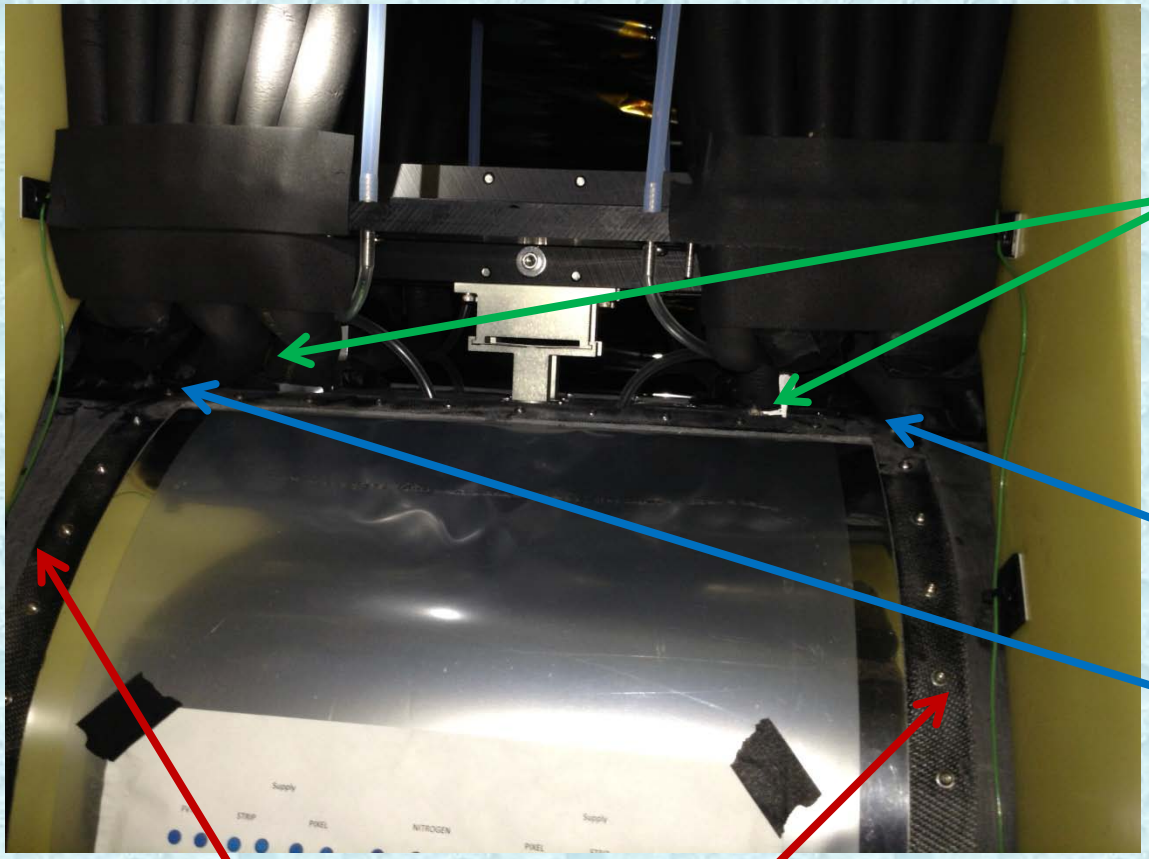
These are the FVTX supply lines as they enter the enclosure. They are right next to the Strip lines shown in slide 2. They run at the same temperature (below 10C) and will condense water if exposed to air.

Any water that condenses on these lines can easily follow the tubes into the FVTX area. From there, water can easily drip onto the wedges



FVTX

Recommendations for this Shutdown (starting point)



Gap between insulation and detectors must be air tight to prevent condensation. We had water in many areas along the cooling lines once the humidity in the IR went up in June.

RTV or gasket the holes in the composite. This will prevent water from dripping into detector if there is condensation. We need to experiment with different types so that it can be removed for maintenance.

Window Frame: Remove window and seal the inner edge with RTV. It still can be removed if needed, but this will prevent air and water from entering the enclosure. From experimenting with N2 flow, it was seen that the outer strip pixels currents are sensitive to N2 flow indicating air is getting in from the window.