

**JFET Switch on procedures for PFM1**

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1.0 7 Jan 2005 First issue after discussion

**0 Scope**

Two switch-on procedures are specified that allow for the safe operation of the JFETs. The first is to switch on the JFETs without using the heater. In the event the JFETs do not self start there is a possibility that current will be drawn through the detectors causing the 300-mK stage to heat up. This will be tested during the PFM1 test campaign – if the JFETs consistently “self start” then the heater will not be used. The second procedure is to be used if it is found that the JFETs do not self start. At present we do not know the minimum heater voltage required to allow the JFETs to start under normal operational circumstance and an initial test is required to find the best operating point.

**1 Procedure to switch on without heater**

Switch on LIAs

Switch on detector biases at nominal frequency setting and 1 mV to allow data transmission and small bias across detector to see change in signal

Set up QLA to monitor detector signals

Set up QLA to monitor sub-K temp

Switch on  $V_{dd}$  to all JFETSImmediately send command to switch on  $V_{ss}$  at -1.5 V – for test only – once optimum voltage established we will use this.Load into stack but do NOT activate commands to switch off  $V_{dd}$  and  $V_{ss}$ .

Detector signals should show immediate response with step and/or drift and start to look like noise

Sub-K temp should not show any response

Wait at least 3 minutes

**If detectors show response then leave JFETs on and remove commands from stack****If detector signals do not respond (flatline) and/or temperature response shows significant response then send commands to switch off  $V_{dd}$  and  $V_{ss}$ .****Do NOT switch on JFET for another three minutes.****2 Procedure to switch on with heater**

Switch on LIAs

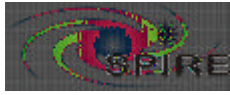
Switch on detector biases at nominal frequency setting and 1 mV to allow data transmission

Set up QLA to monitor detector signals

Set up QLA to monitor sub-K temp

Switch on JFET heater at 2 V

Wait 1 minute

**JFET Switch on procedures for PFM1**

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Switch off JFET heater

Immediately send command to switch on  $V_{dd}$  to all JFETS

Immediately send command to switch on  $V_{ss}$  at -1.5 V

Load into stack but do NOT activate commands to switch off  $V_{dd}$  and  $V_{ss}$ .

Detector signals should show immediate response with step and/or drift and start to look like noise

Sub-K temp should not show any response

Wait at least 3 minutes

**If detectors show response then leave JFETs on and remove commands from stack**

**If detector signals do not respond (flatline) and/or temperature response shows significant response then send commands to switch off  $V_{dd}$  and  $V_{ss}$ .**

**Do NOT switch on JFET for another three minutes.**

If this test fails then repeat with heater voltage increase in 0.25 V steps until good switch on characteristics are found.