SPIRE electrical isolation joints
E Sawyer

Scope

This document highlights the precautions necessary to ensure electrical isolation of the SPIRE FPU.

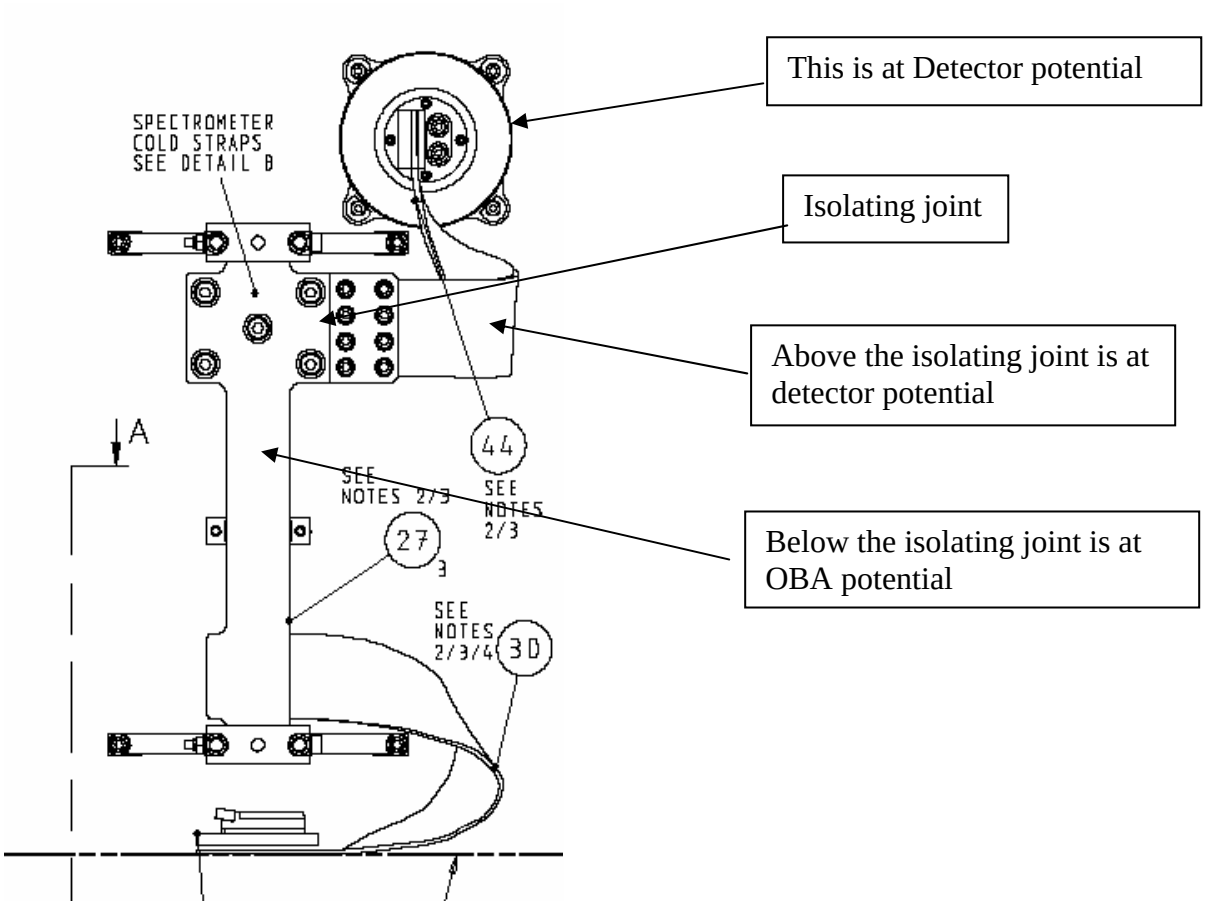
Background

The SPIRE instrument incorporates an isolated ground system, where the detector ground is separated from the FPU which is in turn separated from the OBA.
During the STM2 test campaign, a short was discovered between the FPU and OBA and between the detectors and FPU.

On investigation at EADS Friedrichshafen, in April 2007, ref HP-2-ASED-SD-0162 Iss: 1. Single layer insulation (SIL) was discovered insulating temperature sensors on the L0, L1 and L3 thermal interfaces.
This SIL can potentially cause an electrical short at these locations.

LO Interface

On the PFM FPU, this interface should cause no problem as there is no electrical isolation at this point. The electrical isolation is achieved at the bolted joint towards the top of the L0 thermal straps. See below.



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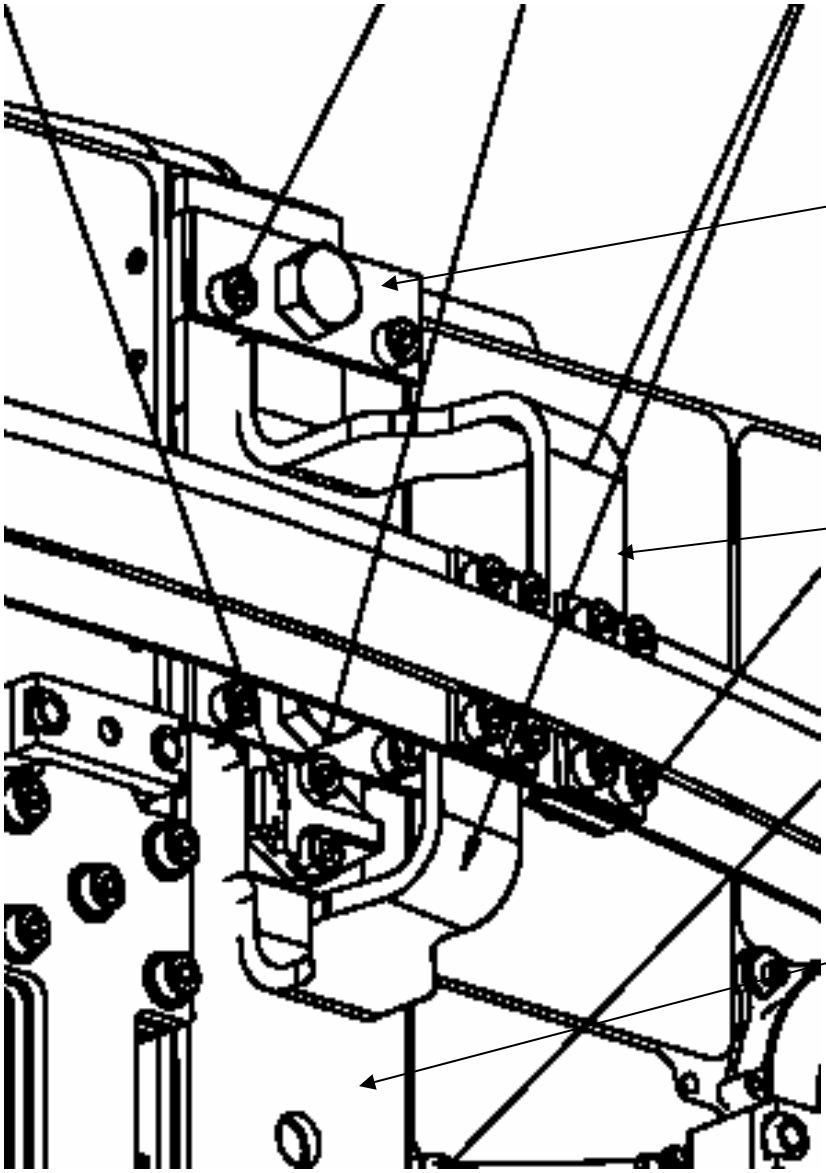
iLI Interface 6

This is critical as the isolating joint is at the interface to the FPU. The plate which clamps the L1 strap is at OBA potential, but the heads of the screws (one off M8 and 2 off M4 at each interface) are at FPU potential. There is only a small gap between objects which are isolated.
All conductive film and tape should be avoided in this area.



L3 Interface a

Like the L1 interface this is a critical location as the isolating joint is at the interface between the L3 strap and the JFET. The stainless steel block that supports the temperature sensor is at the same potential as the OBA, but the JFET including the heads of the screws are at FPU potential. All conductive film and tape should be avoided in this area.