

**Meeting to discuss vibration issues at ESTEC, 17/8/01  
SPIRE-RAL-MOM-000825**

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**Summary of a very useful discussion.**

**General points**

First natural frequencies of the detectors are around 200 Hz, which is well away from the instrument frequencies.

Payload on the optical bench is approx 44 Hz.

Herschel Optical bench is 60 to 80 Hz.

Actual flight loads are likely to be very low.

Notches shall never exceed 1/3 octave at the bottom.

**Suggestions for the Detector box optimisation**

Consider hyperstatic mounting of the detector box. Optimise performance in the directions where they can do the most good.

One fixed cone and two bipods.

Consider lowering the natural frequency of the instrument.(make the instrument a low pass filter)

Fit extra leg on top of detector box mounted directly on to the clamshell.

**Vibration testing at instrument level**

ESTEC cannot at present agree notches other than the one to limit the instrument level interface forces.

Notching at instrument level could be by a single 3-axis accelerometer, on the outside of the instrument.

IIDA will be updated in due course to include notching philosophy and reduction in overall level above 200Hz from 0.05 to 0.03  $g^2/Hz$ .

SPIRE to raise waiver/ECR.

**Vibration testing at detector level**

BDA input spectrum proposed by SPIRE is 0.8  $g^2/Hz$  between 100 Hz and 300 Hz and allow notching to limit to 100g equivalent static load at the natural frequency, using control limiting. This equivalent to 25 gRMS, overall level, on a 4-sigma basis. ESTEC comment was that 100g static equivalent load is a reasonable figure for a subsystem.