PROCESS SYSTEMS INTERNATIONAL, INC.
20 Walkup Drive, Westborough, MA 01581

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October 9, 1996
V049-PL-292

Fax No.: (818) 304-9834

Mr. Alan Sibley c/0 Ms. Linda Turner
CALIFORNIA INSTITUTE OF TECHNOLOGY
LIGO Project
102-33 East Bridge Laboratory
Pasadena, CA 91125

Subject: **80K pump Test Data**

Dear Alan:

Attached please find a preliminary report from C.A.A. on the vibration test of the 80K pump (mounted inside the prototype BSC).

The full report will be presented at the prototype vessel data review meeting.

Please call if you have any questions.

Sincerely,

Richard Bagley
LIGO Project Manager

REB/lml

cc: J. Worden - WA Site
M. Zucker - MIT
LIGO File PL-290

96:REB:V049-PL-292

CAMBRIDGE ACOUSTICAL ASSOCIATES, INC.
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LIGO VENDOR
3.1.3-6

10 October 1996

Process Systems International, Inc.
20 Walkup Drive
Westborough, Ma 01581

Attn.: Richard Bagley

Attached are acceleration measurements of the cryopump source characterization. Accelerometers were located on the cold side of the cryopump spring support in the vertical and lateral direction and in the vertical direction on the warm side of the cryopump. There also was an accelerometer in the vertical direction at the base of the beamsplitter, the chamber for the cryopump, to evaluate ground vibration into the system. Measurements were made for various heat loads or exhaust vapor flow rate. Background measurements with the system at room temperature (not operating) were recorded. The following summarizes are conclusions:

1. The accelerometer measurements on the cold side of the spring had sufficient signal-to-noise and are assumed to be good measurements (see Fig. 1 and 2). The measurements did not show a dependency on flow rate as was anticipated. For a quick comparison, the LIGO spec. is approximately -160 dB between 10 and 1000 Hz compared to the -100 dB measured. A transfer function and coherence plot between the two cold measurements is shown in Fig. 3.

2. The accelerometer measurements on the warm side of the spring were the same in both the operating and non-operating conditions. The sensitivity of the accelerometer was not sufficient to measure the low levels. A separate test will be performed on the spring to determine its transfer function.

3. A high sensitivity accelerometer was used at the base of the beamsplitter. The vibration due to the cryopump boiling was not evident in the measurements.

Sincerely

Kyle Martini

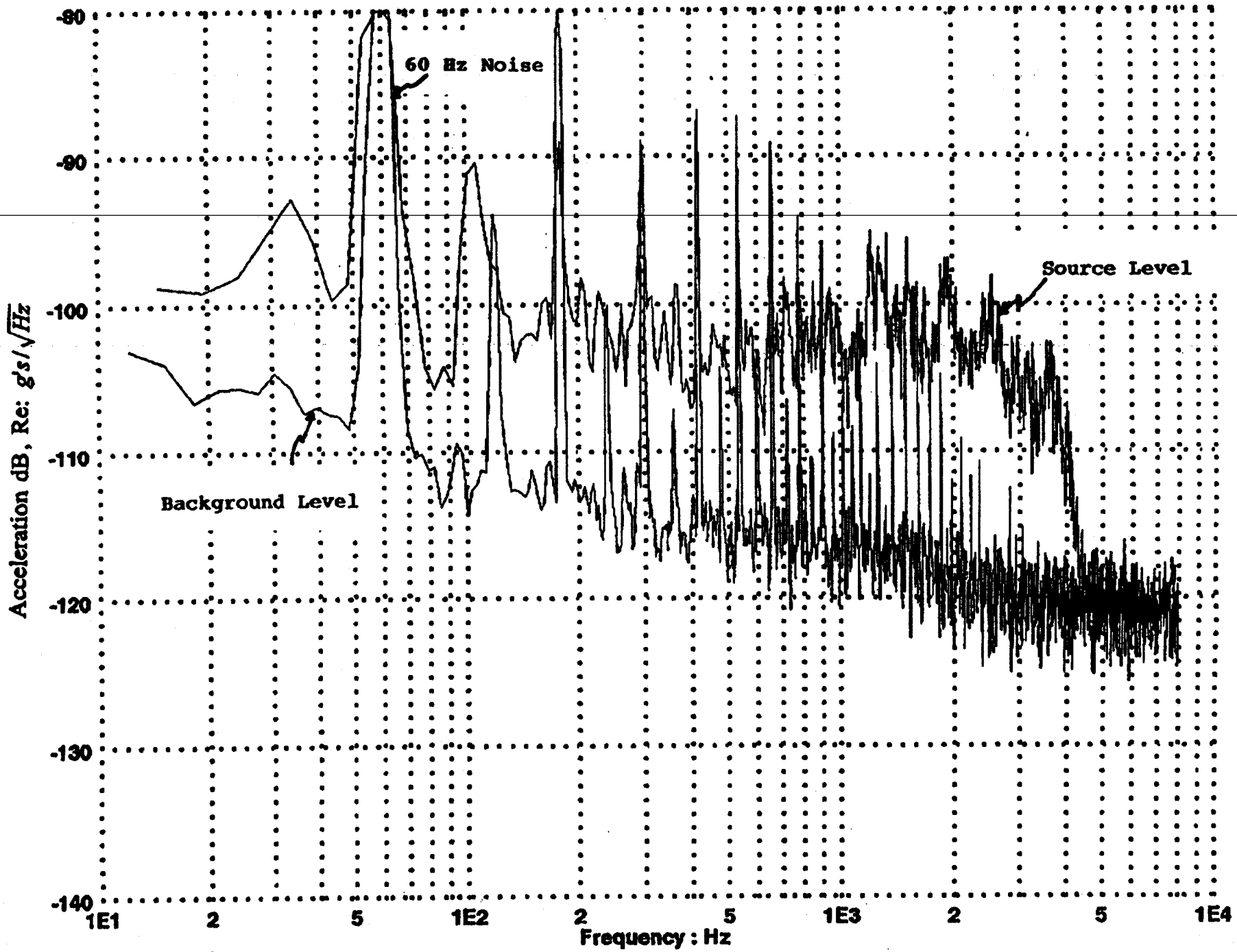

Fig. 1 Cryopump cold side vertical acceleration (CAA accelerometer).

FLOW = 4.1

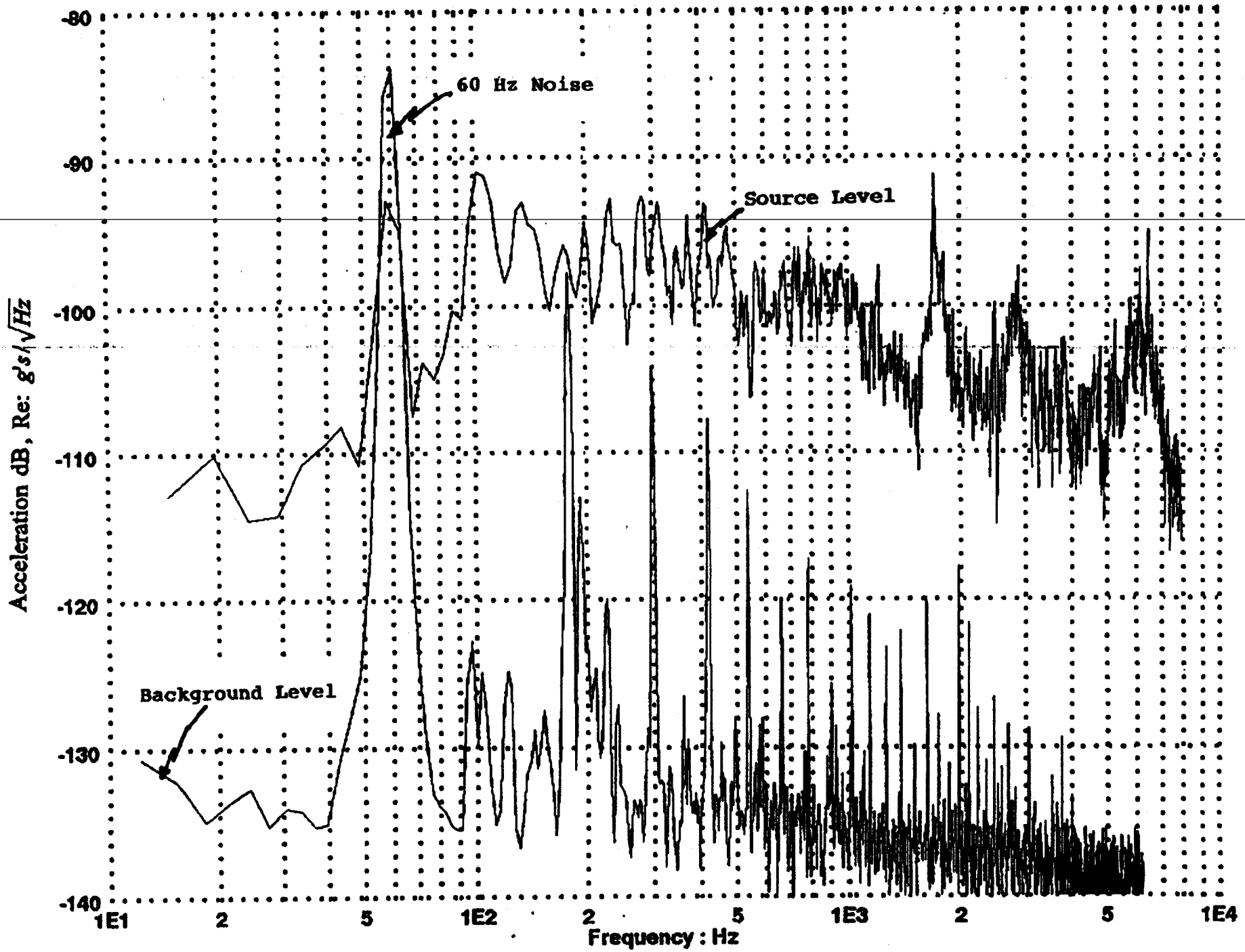

Fig. 2 Cryopump cold side lateral acceleration (MIT accelerometer).

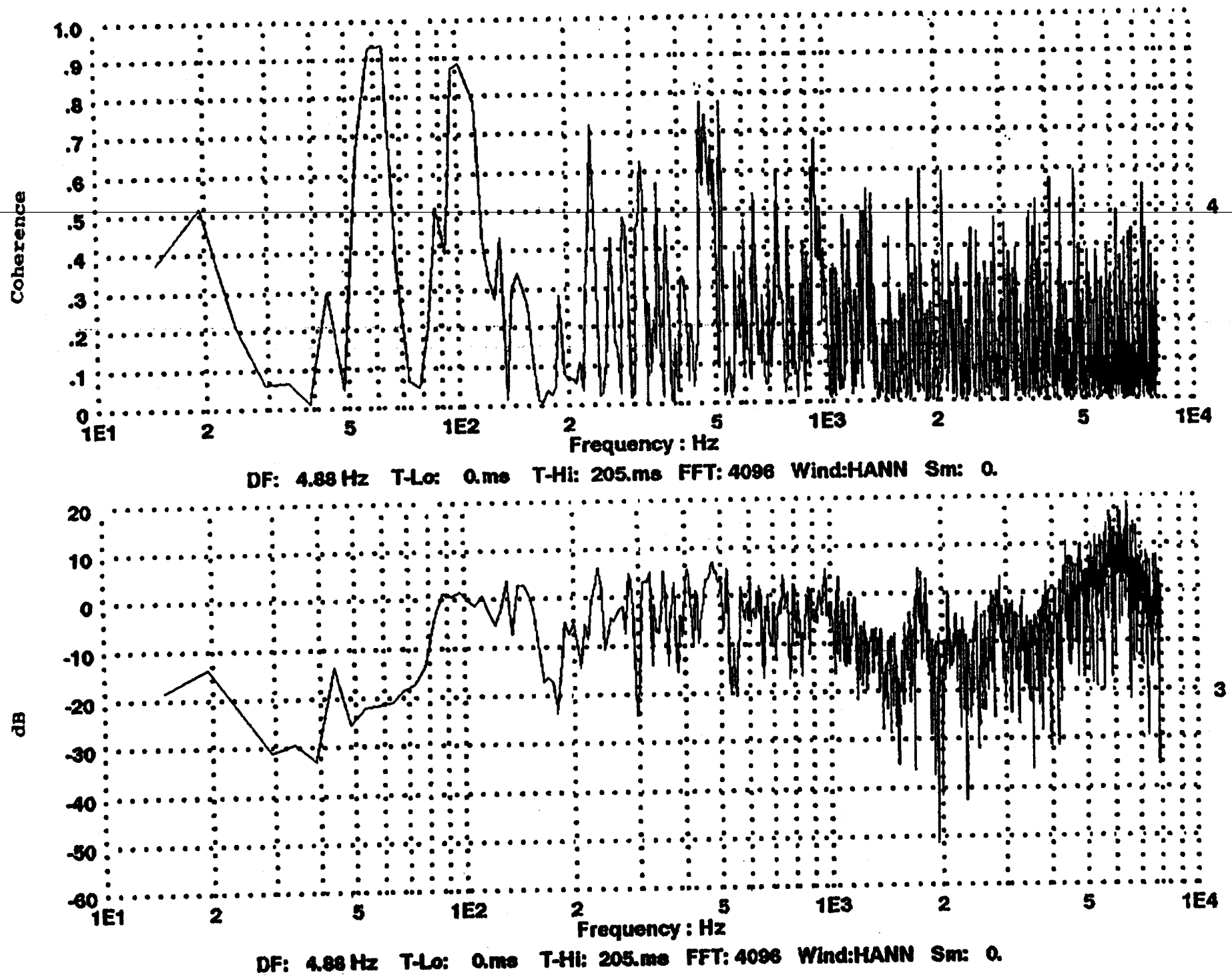

Fig. 3 Cryopump transfer function and coherence between cold side vertical and lateral acceleration.

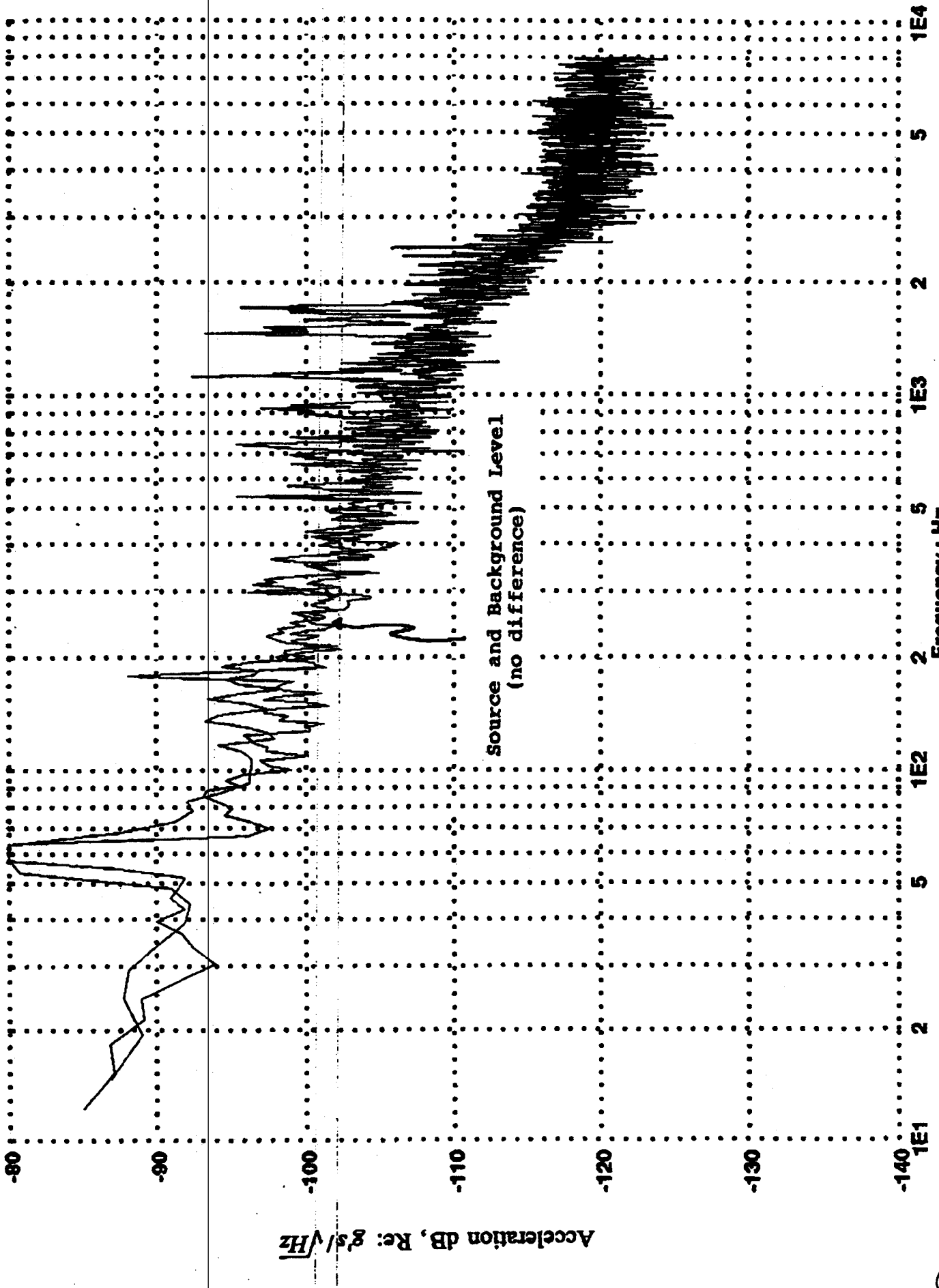

Fig. 4 Cryopump warm side vertical acceleration (CAA accelerometer).

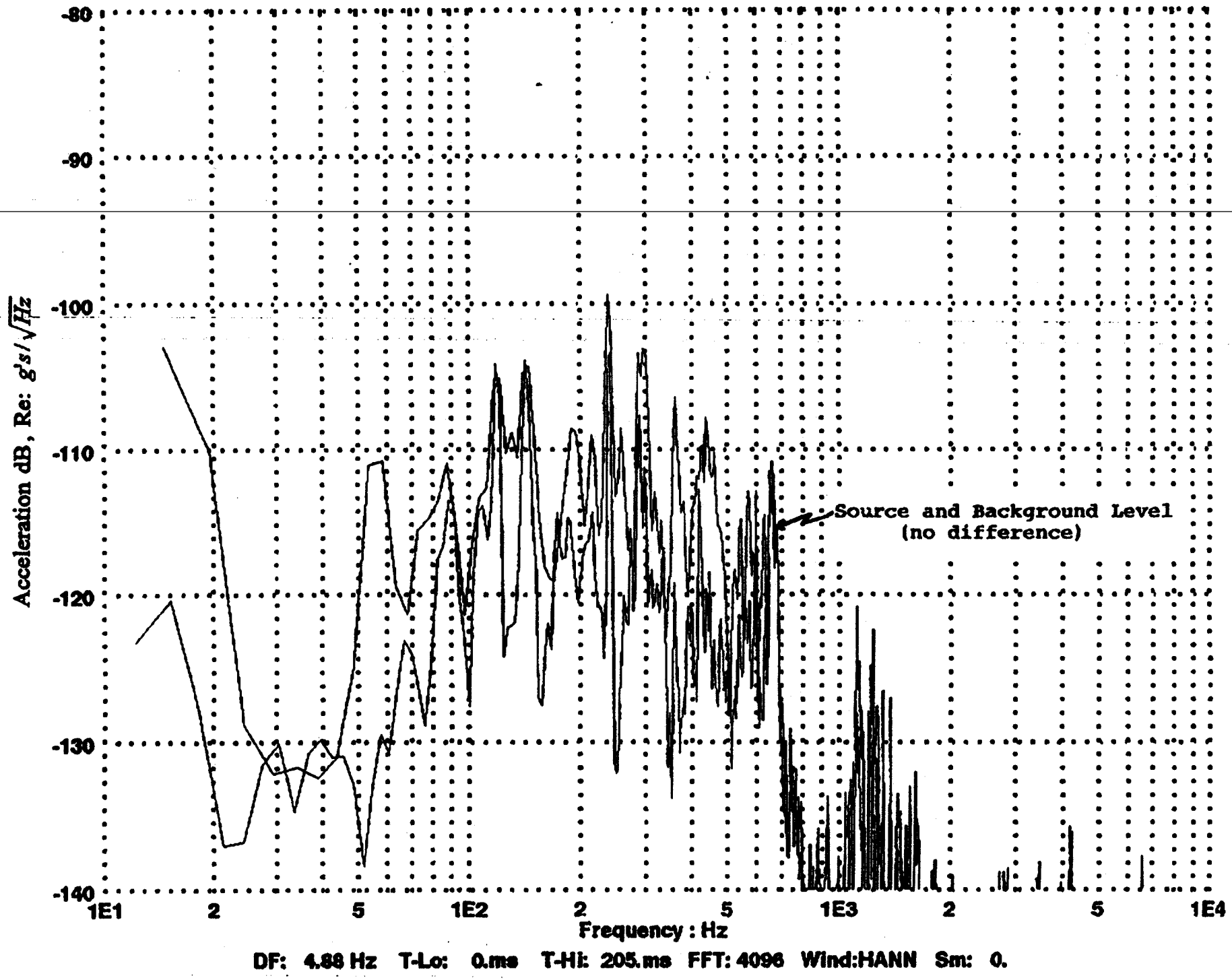

Fig. 5 Cryopump support (beamsplitter) vertical acceleration.