

Advanced LIGO Anti-aliasing and Anti-image Filter Function

LIGO-T070038-00-C

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27 February, 2007

1. Overview and Background

A standard filter function for AdLIGO anti-aliasing and anti-image functions has been developed. The notion of a standard filter function permits bulk manufacture of circuit boards, and in the majority of applications represents a complete solution. The small number of more stringent applications requiring additional filtration will be addressed as outliers and accommodated during the design cycle.

The base ADC/DAC sample frequency is 65,536 Hz for the AdLIGO Expansion Chassis. A 16 kHz decimation filter is planned. A notch filter at the ADC/DAC sample frequency is part of the design.

2. Filter Description

- 2.1. Main Filter Function - 3rd order Butterworth
- 2.2. Main Filter Corner Frequency – 10kHz
- 2.3. Notch Filter – Twin-T type filter, Q of ~5, centered at 65,535 Hz
- 2.4. Resulting phase shift at 1kHz - ~minus 15 degrees

3. Filter Function

