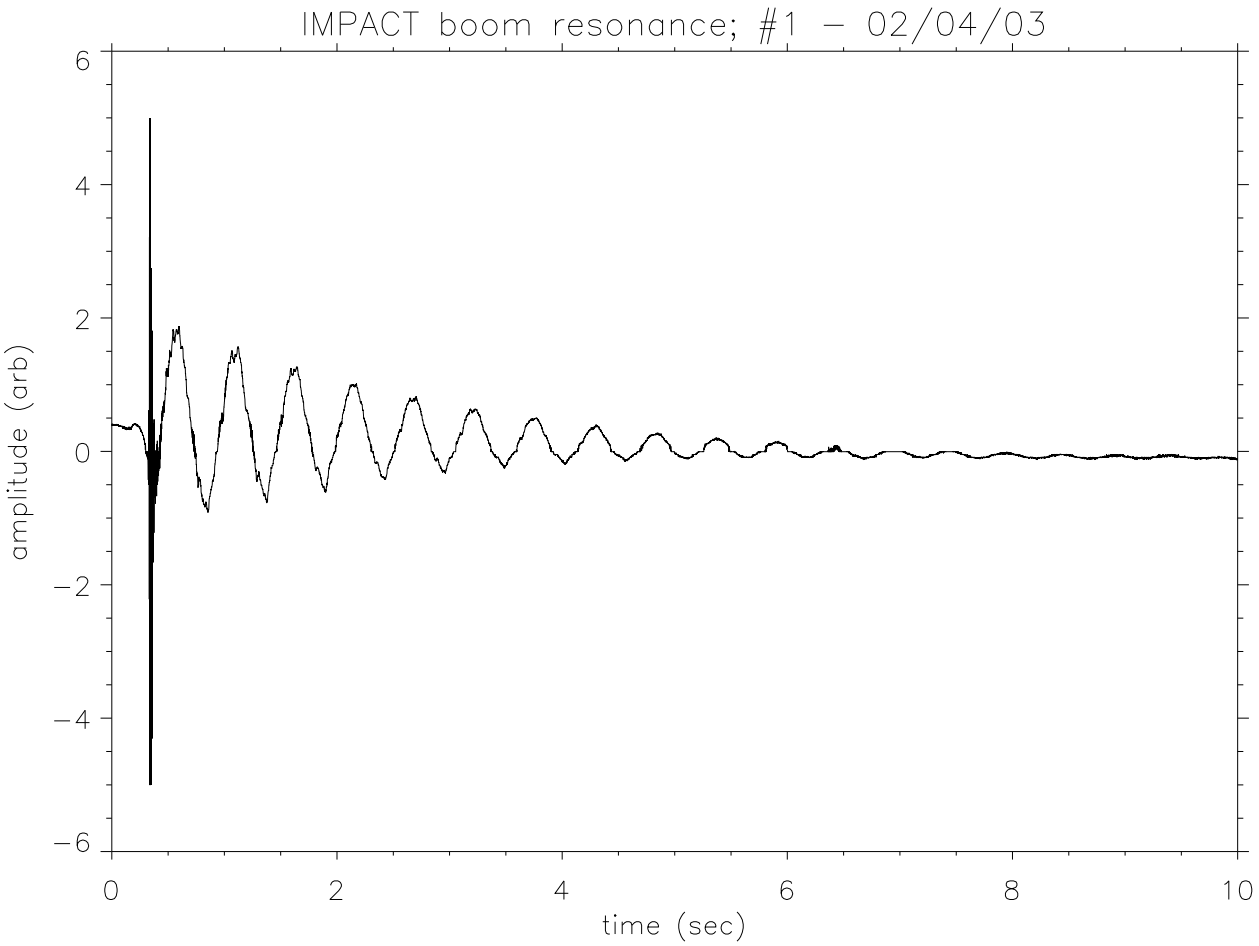
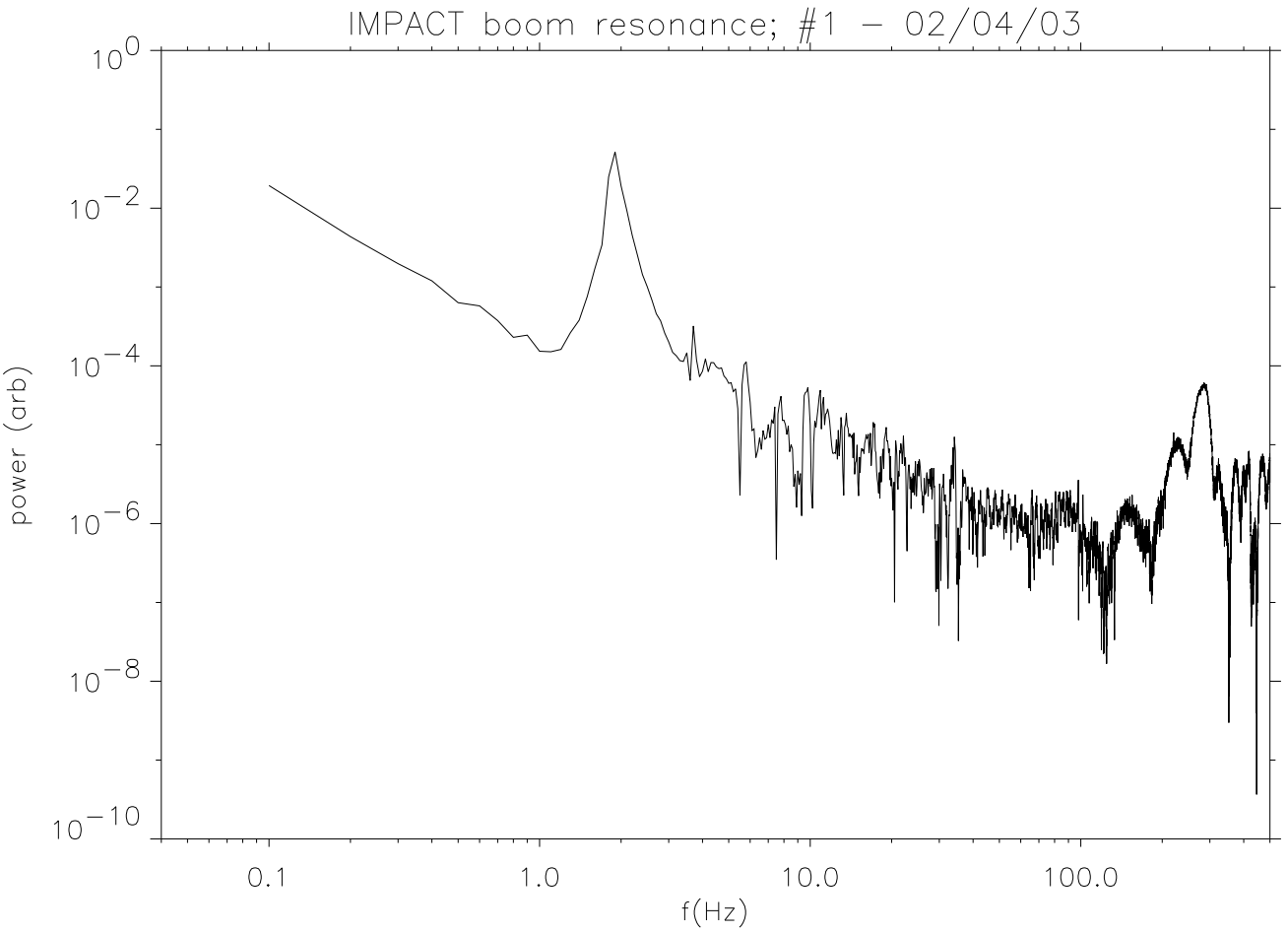
IMPACT Boom resonance tests

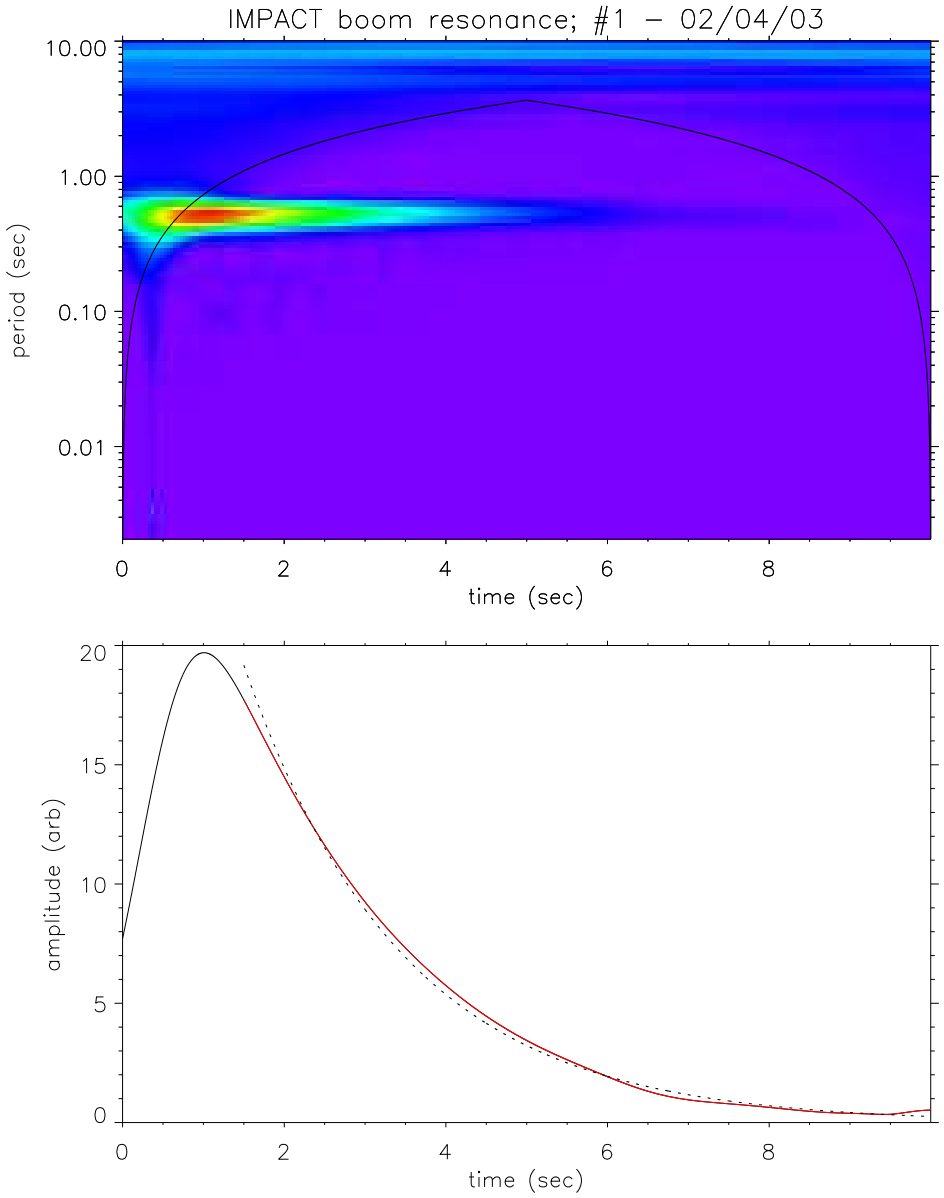
	Test 1	Test 2	Test 3
f_1	1.9 Hz (0.526 s)	1.9 Hz (0.526 s)	1.94 Hz (0.517 s)
Δf (FWHM)	0.202 Hz	0.198 Hz	0.17 Hz
$\Delta f/f_1$	0.106	0.97	0.087
α	0.51 s^{-1} (1.96 s)	0.46 s^{-1} (2.19 s)	0.426 s^{-1} (2.35 s)
damping ratio	4 %	3.8 %	3.5 %

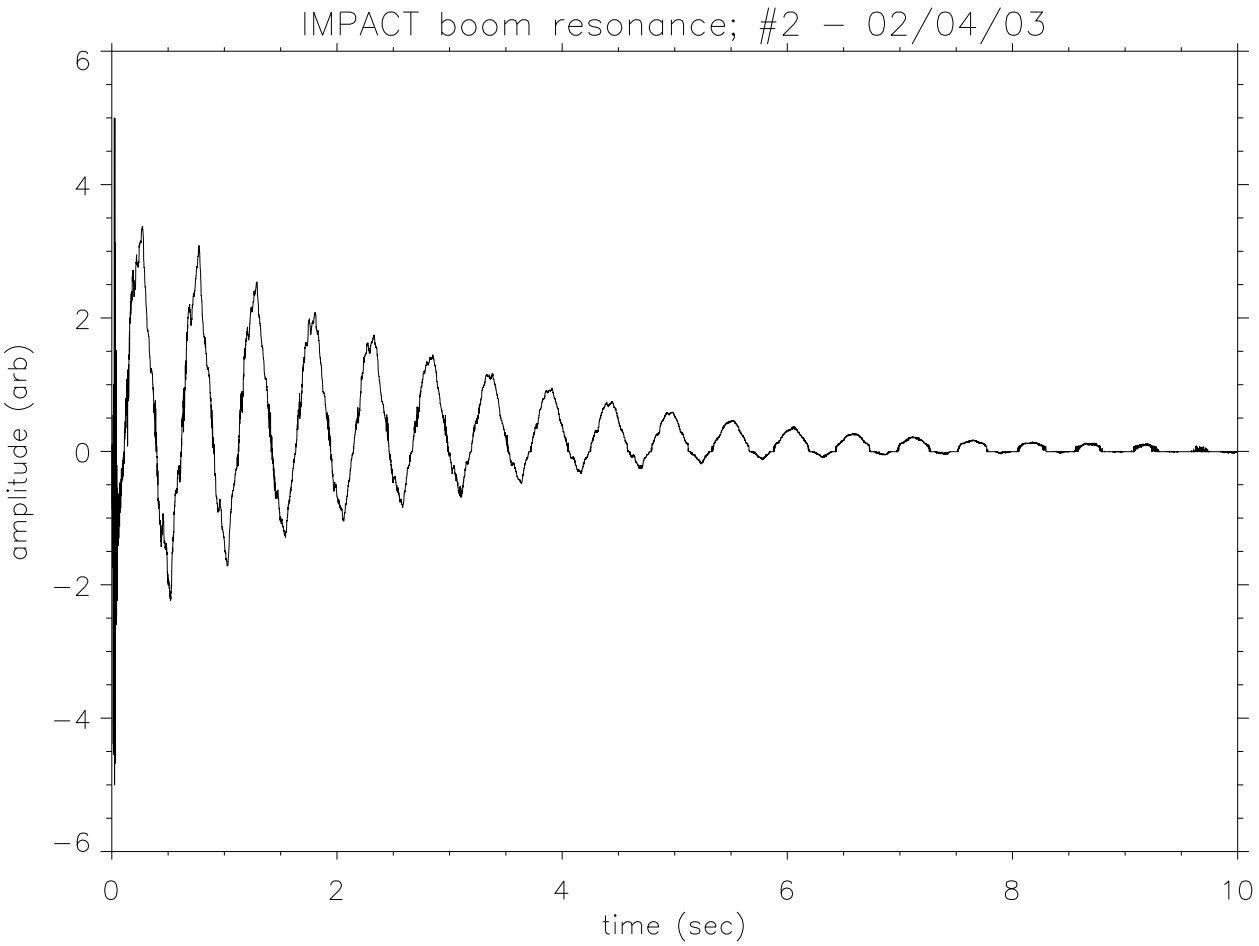
Notes:

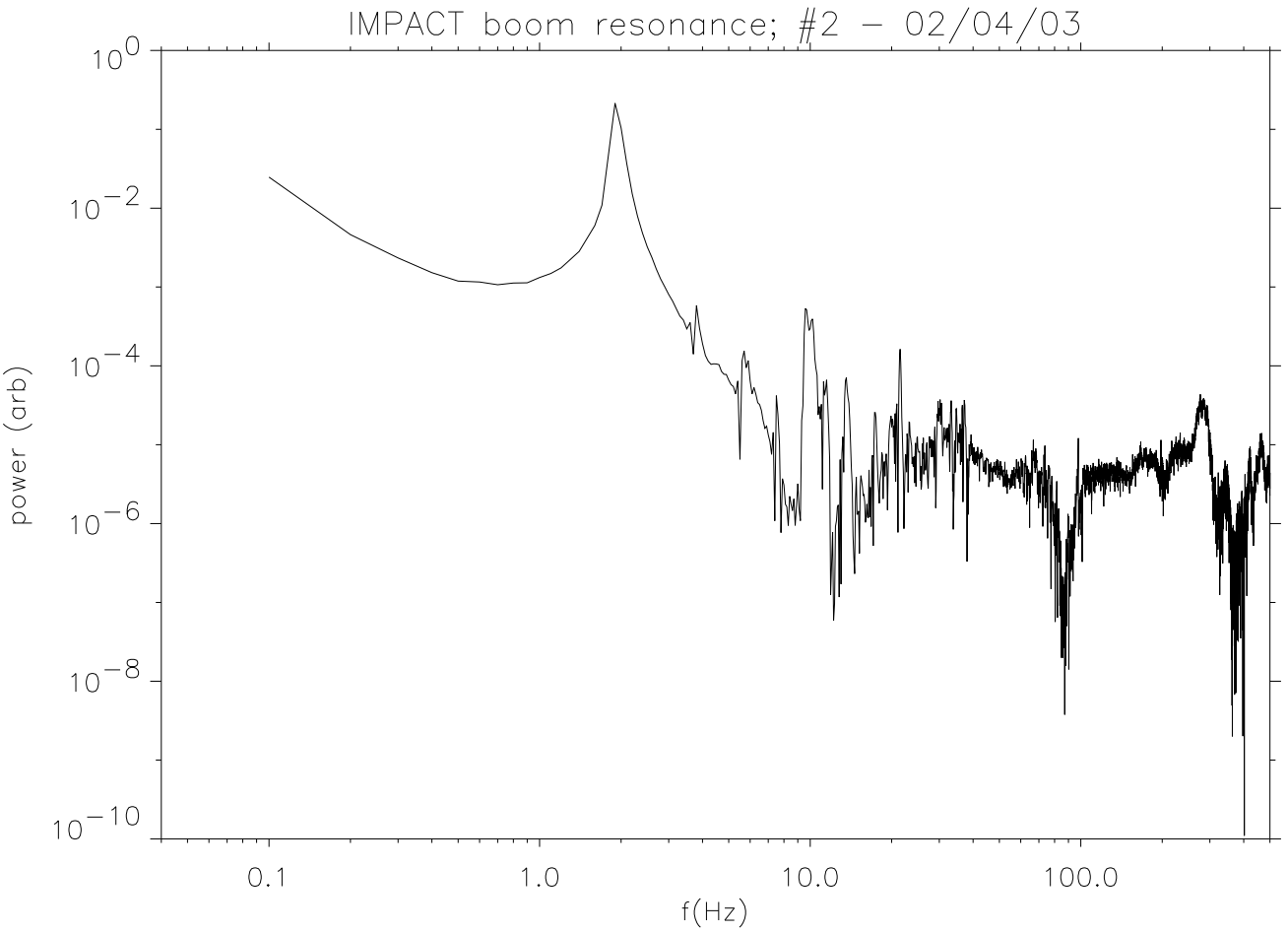
1) wavelet transform is only valid within the black 'cone of influence' see on the spectrogram
2) wavelet amplitude (bottom panel) is the average amplitude between the dotted lines on the spectrum, slightly greater than the FWHM interval
3) the function $\exp(-\alpha t)$ is fitted to the red part of the amplitude to obtain α
4) damping ratio is $1/\sqrt{1 + (\alpha_1/\alpha)^2}$

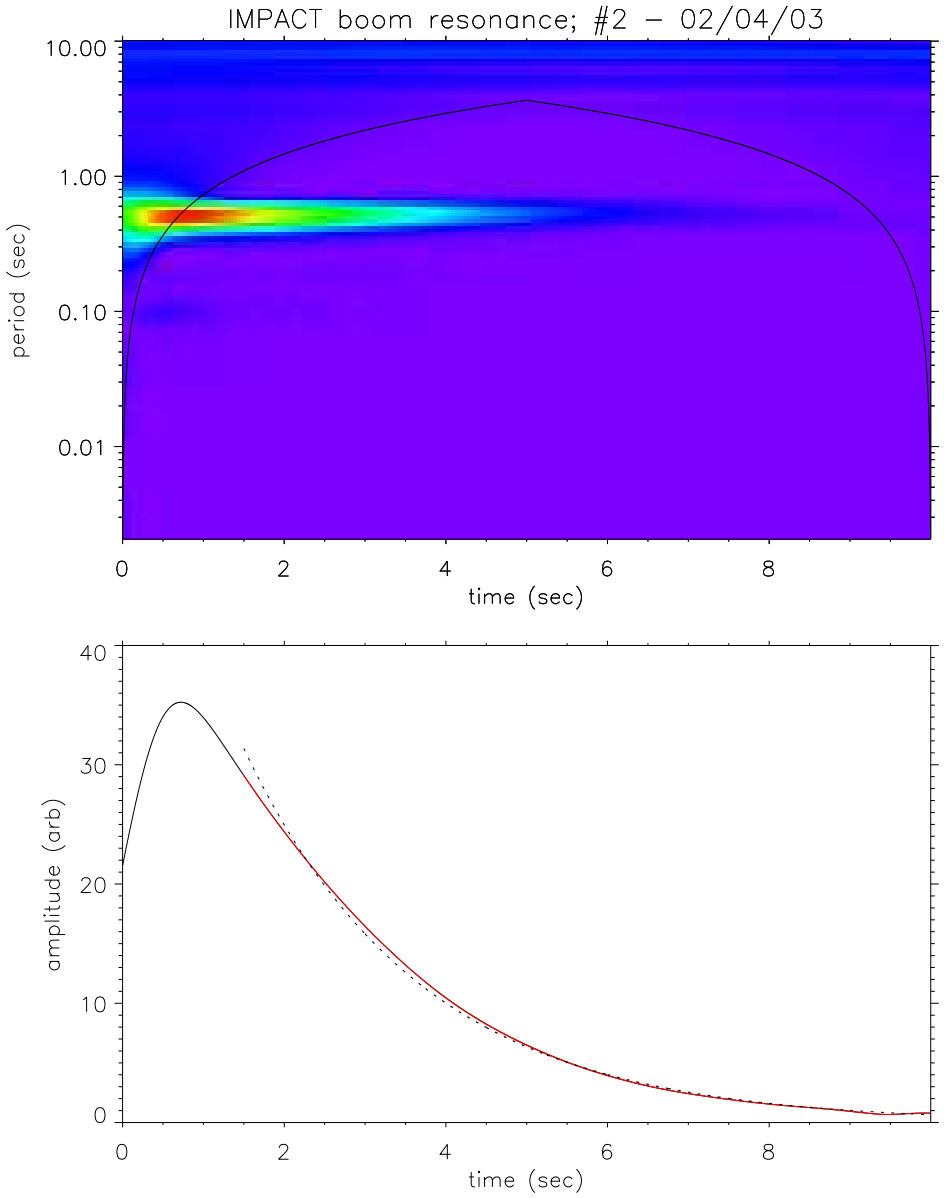

IMPACT boom resonance; #1 – 02/04/03
amplitude (arb)
6
4
2
0
−2
−4
−6
0
2
4
6
8
10
time (sec)

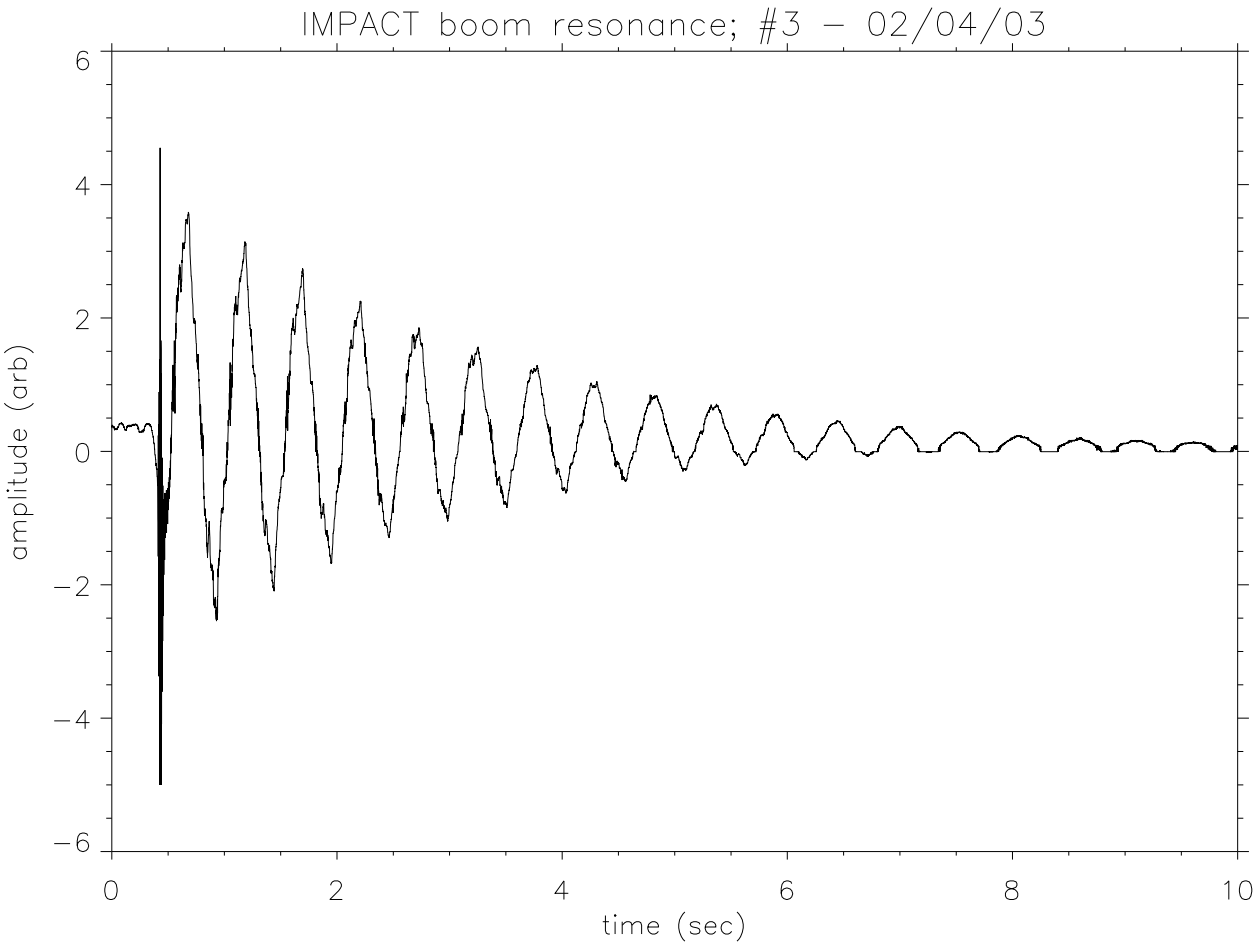

IMPACT boom resonance; #1 – 02/04/03
power (arb)
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
10^{-10}
0.1
1.0
10.0
100.0
f(Hz)

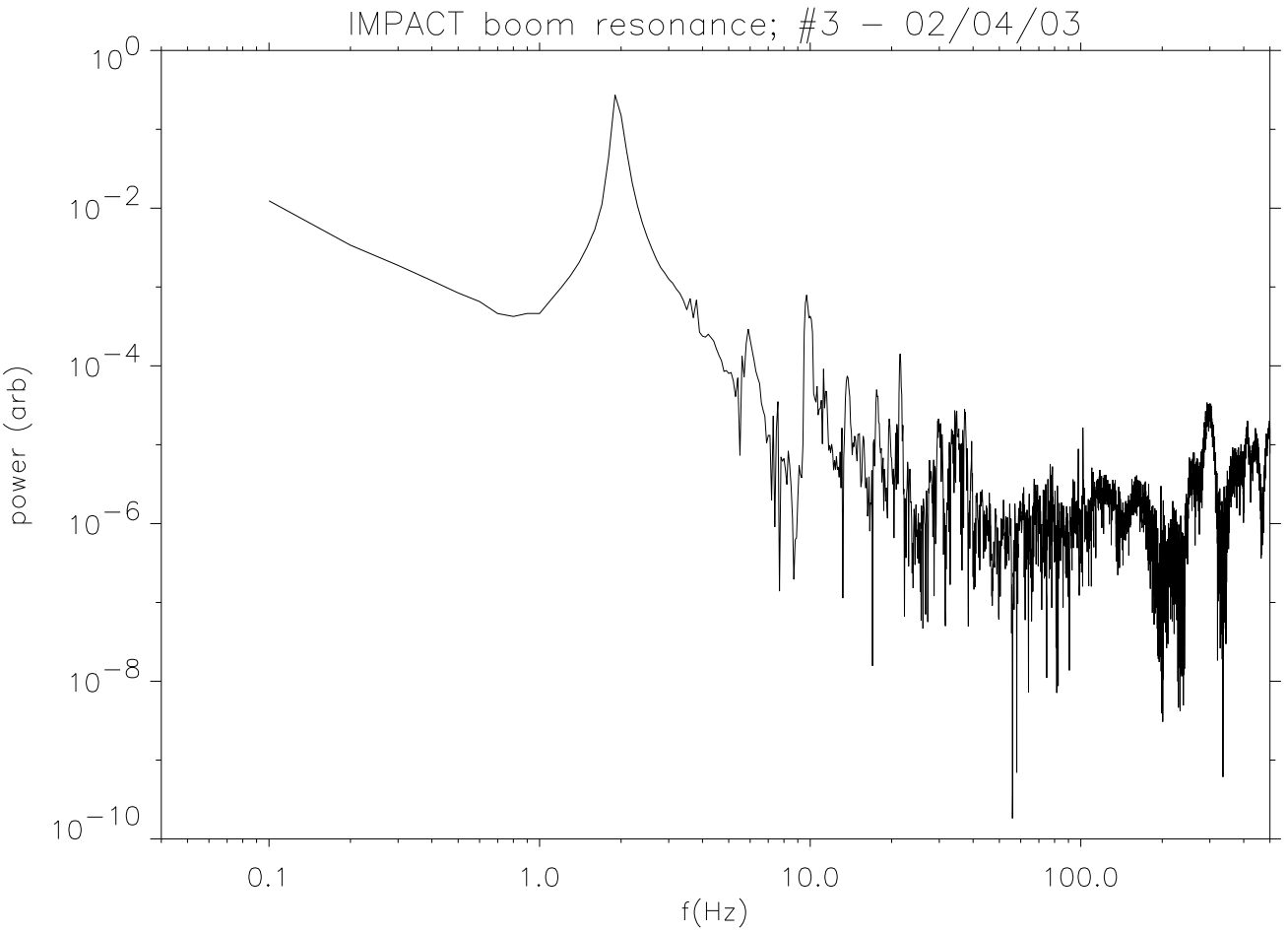

IMPACT boom resonance; #1 – 02/04/03
10.00
1.00
0.10
0.01
period (sec)
0
2
4
6
8
time (sec)
20
15
10
5
0
amplitude (arb)
0
2
4
6
8
time (sec)

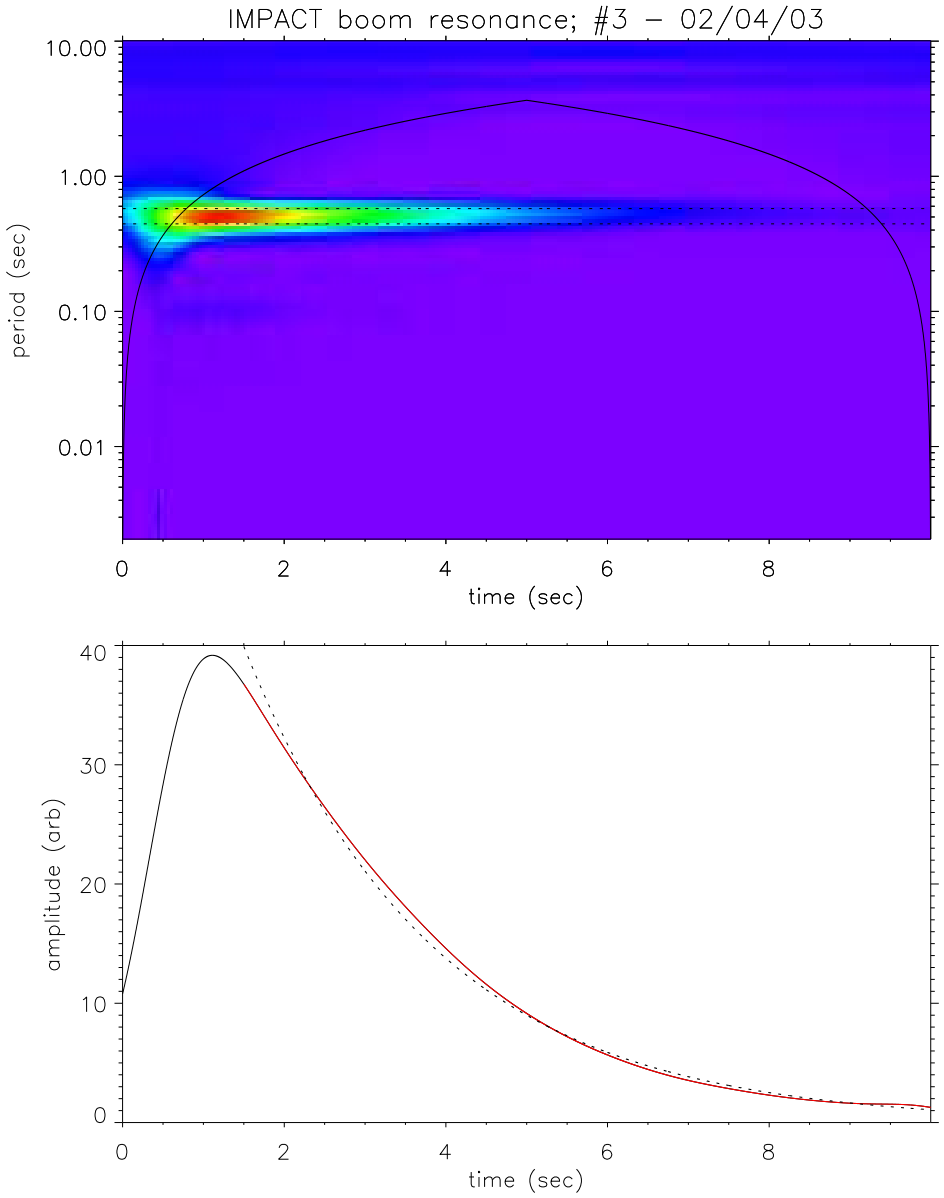

IMPACT boom resonance; #2 – 02/04/03
amplitude (arb)
time (sec)
6
4
2
0
−2
−4
−6
0
2
4
6
8
10


IMPACT boom resonance; #2 – 02/04/03
power (arb)
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
10^{-10}
0.1
1.0
10.0
100.0
f(Hz)


IMPACT boom resonance; #2 – 02/04/03
10.00
1.00
0.10
0.01
period (sec)
0
2
4
6
8
time (sec)
40
30
20
10
0
amplitude (arb)
0
2
4
6
8
time (sec)


IMPACT boom resonance; #3 – 02/04/03
amplitude (arb)
time (sec)
6
4
2
0
−2
−4
−6
0
2
4
6
8
10


IMPACT boom resonance; #3 – 02/04/03
power (arb)
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
10^{-10}
0.1
1.0
10.0
100.0
f(Hz)


IMPACT boom resonance; #3 – 02/04/03
10.00
1.00
0.10
0.01
period (sec)
0
2
4
6
8
time (sec)
40
30
20
10
0
amplitude (arb)
0
2
4
6
8
time (sec)