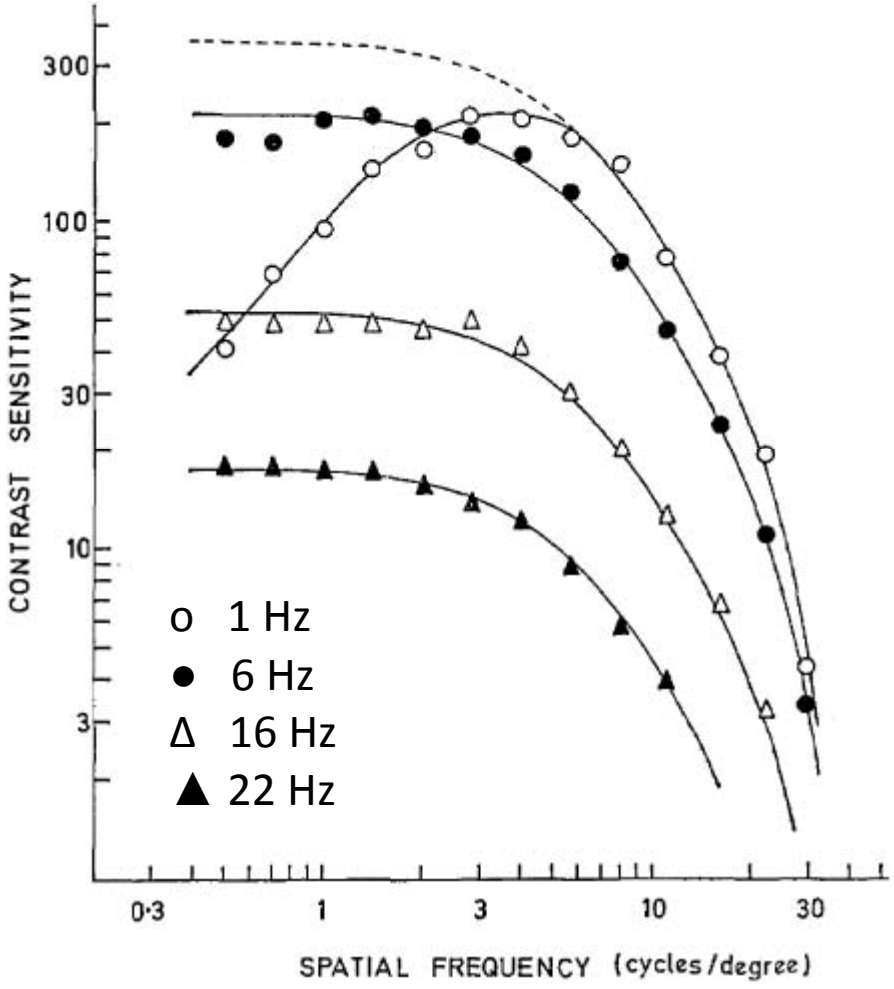
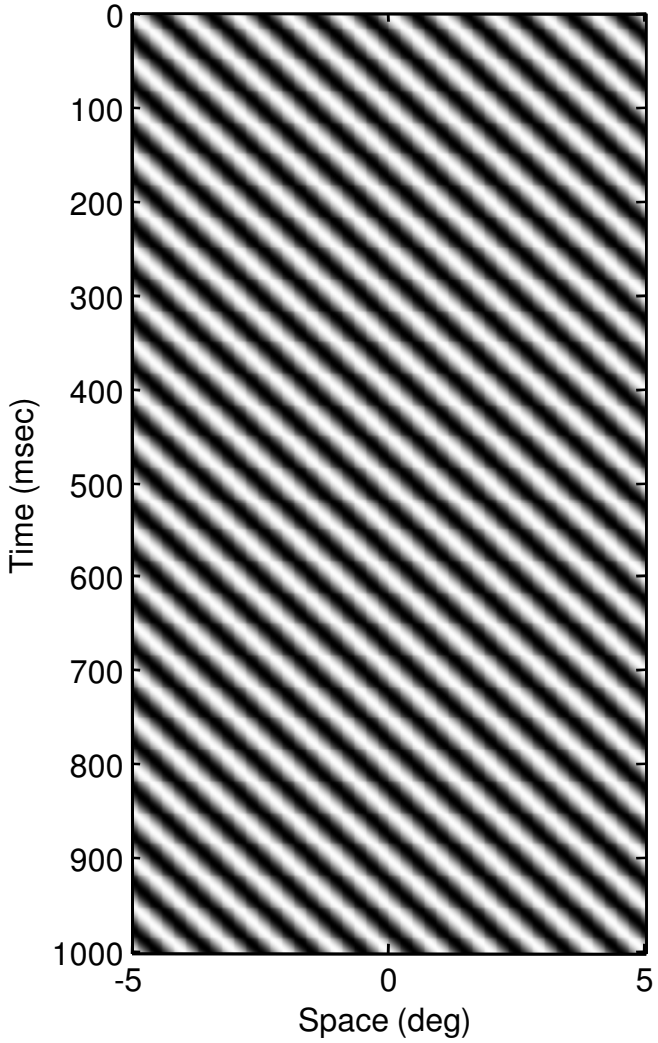
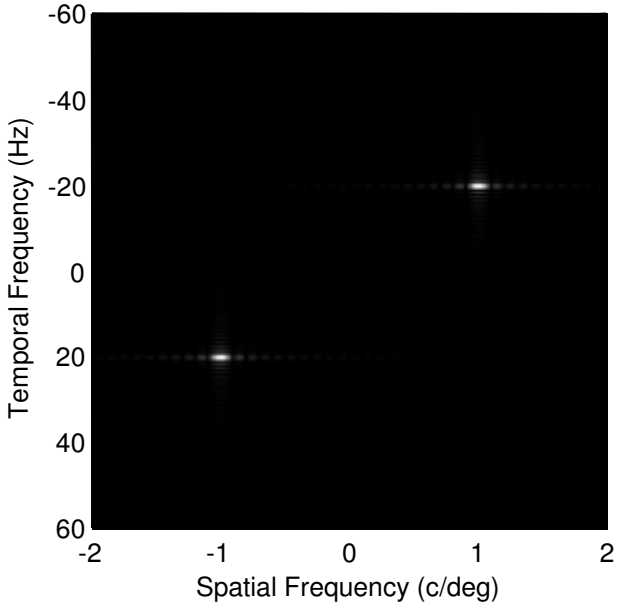
The spatio-temporal contrast sensitivity function:
Spatial contrast sensitivity depends on temporal frequency



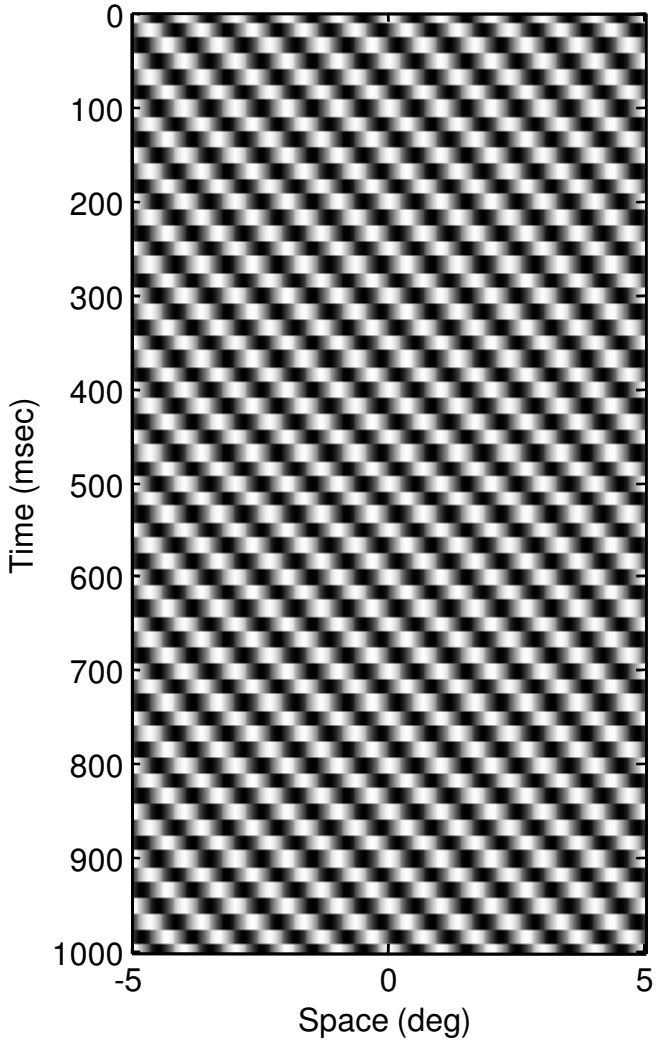
Robson, 1966

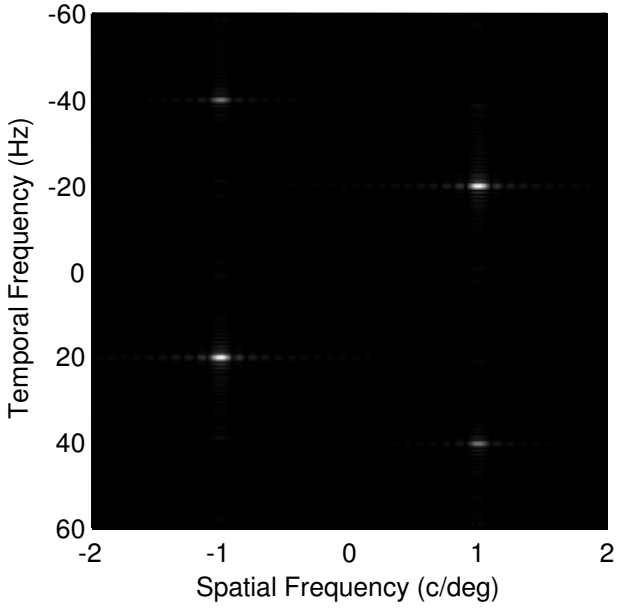
Smoothly moving grating



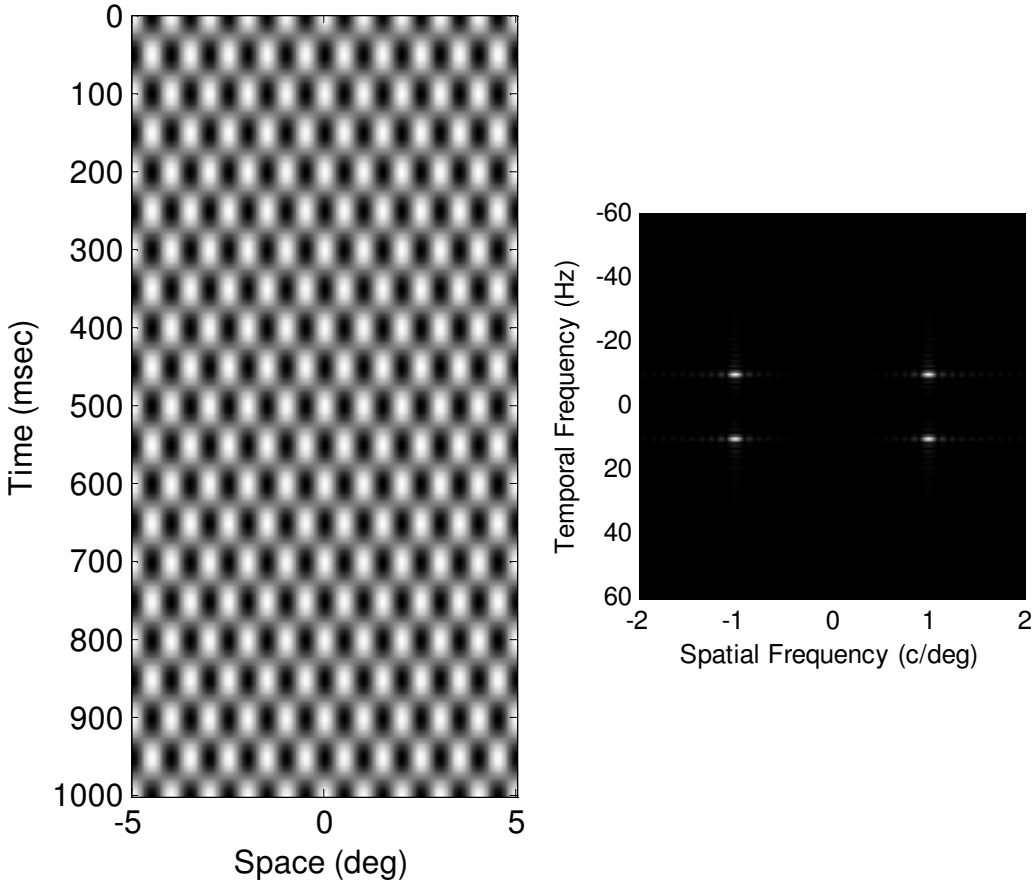


Sampled moving grating (60Hz)

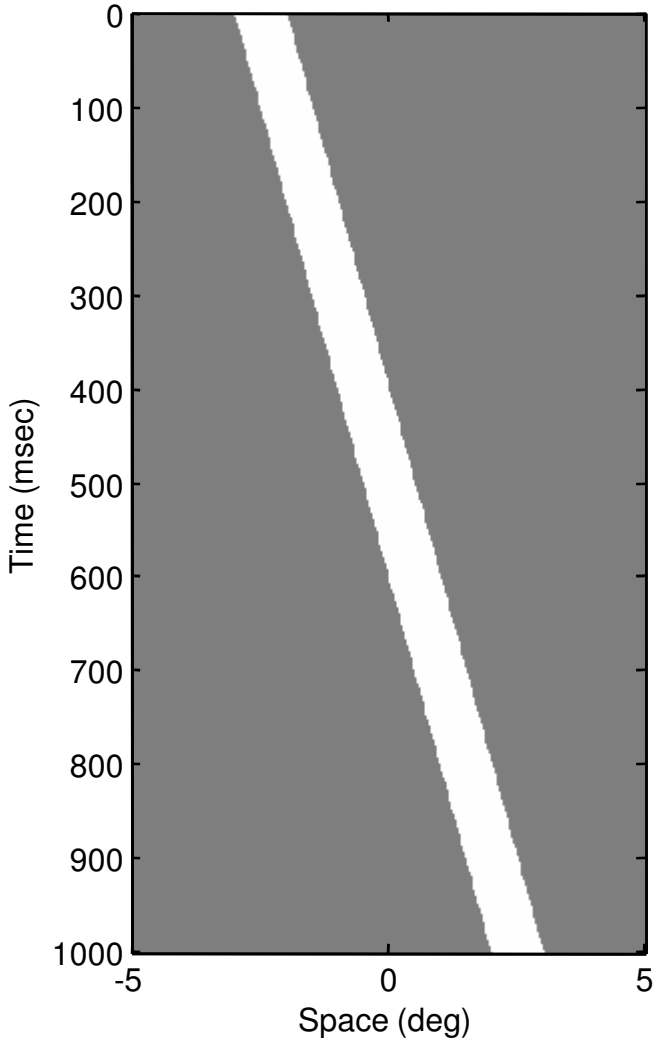


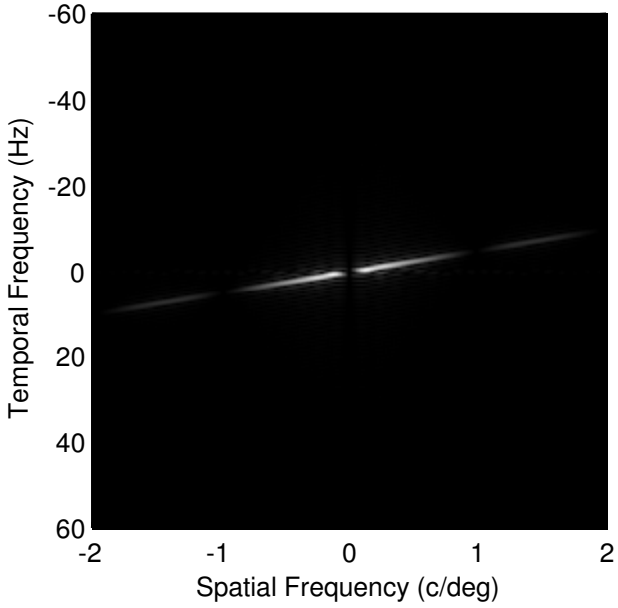


Counterphase grating

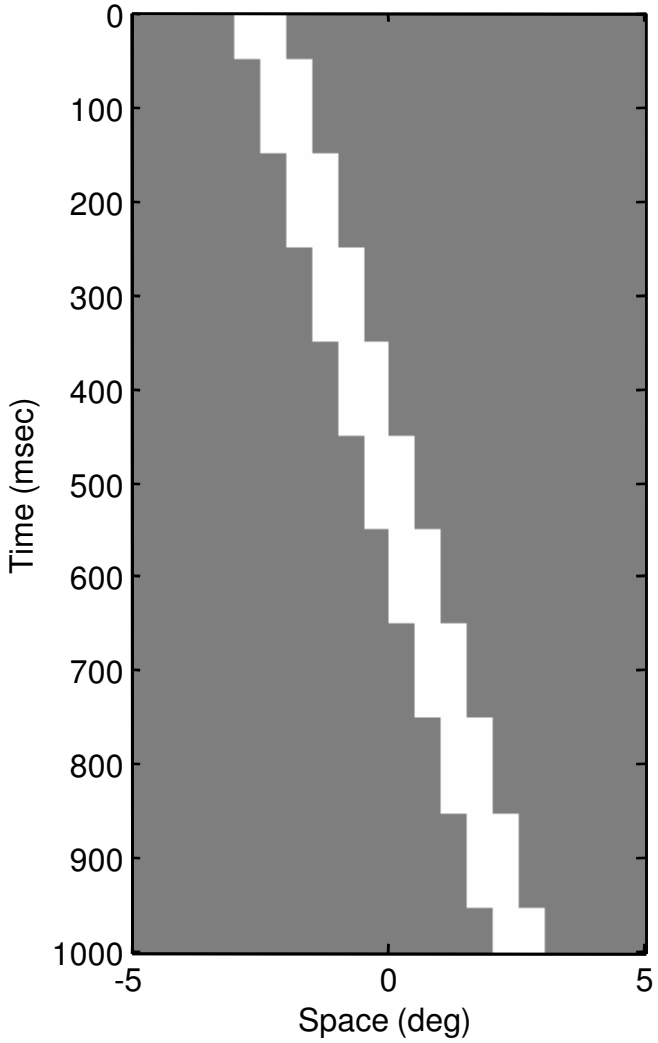


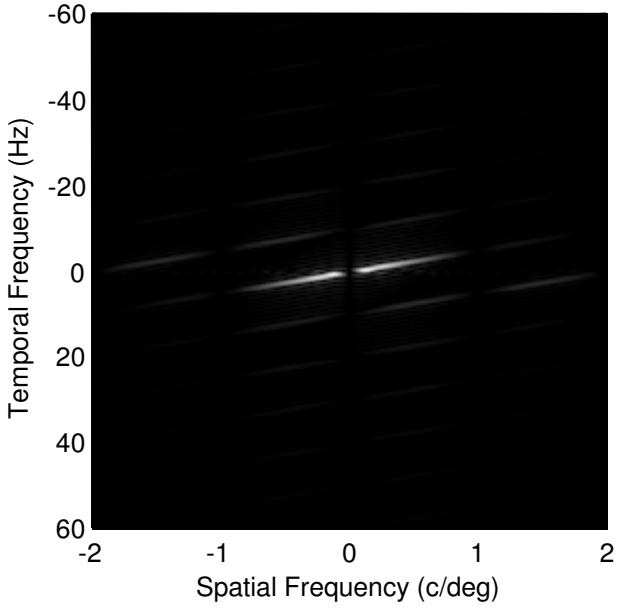
Smoothly moving bar



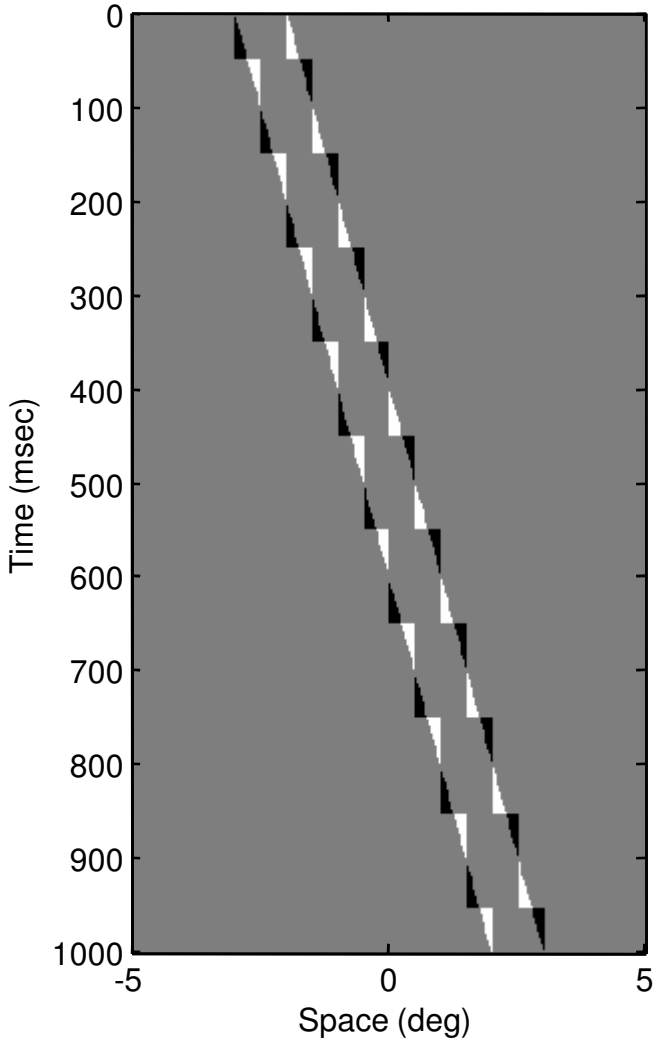


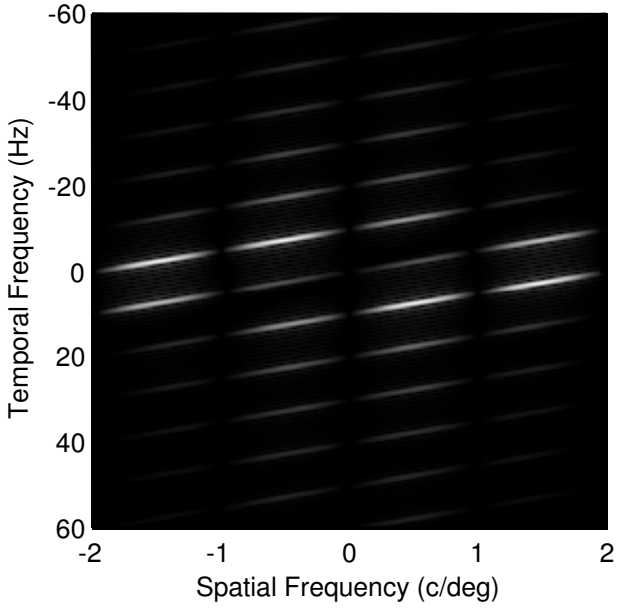
Sampled moving bar



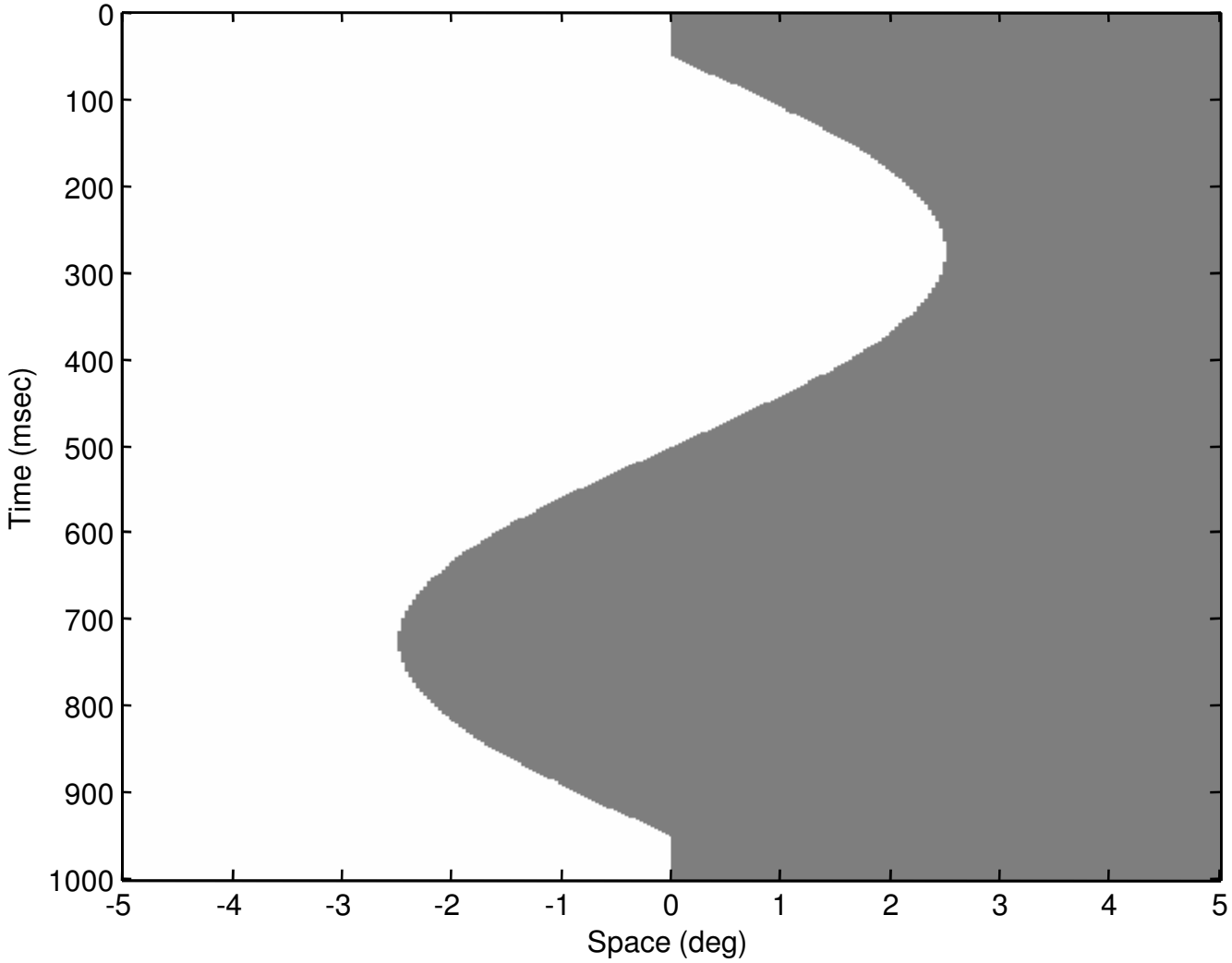


Difference between smooth and sampled moving bar

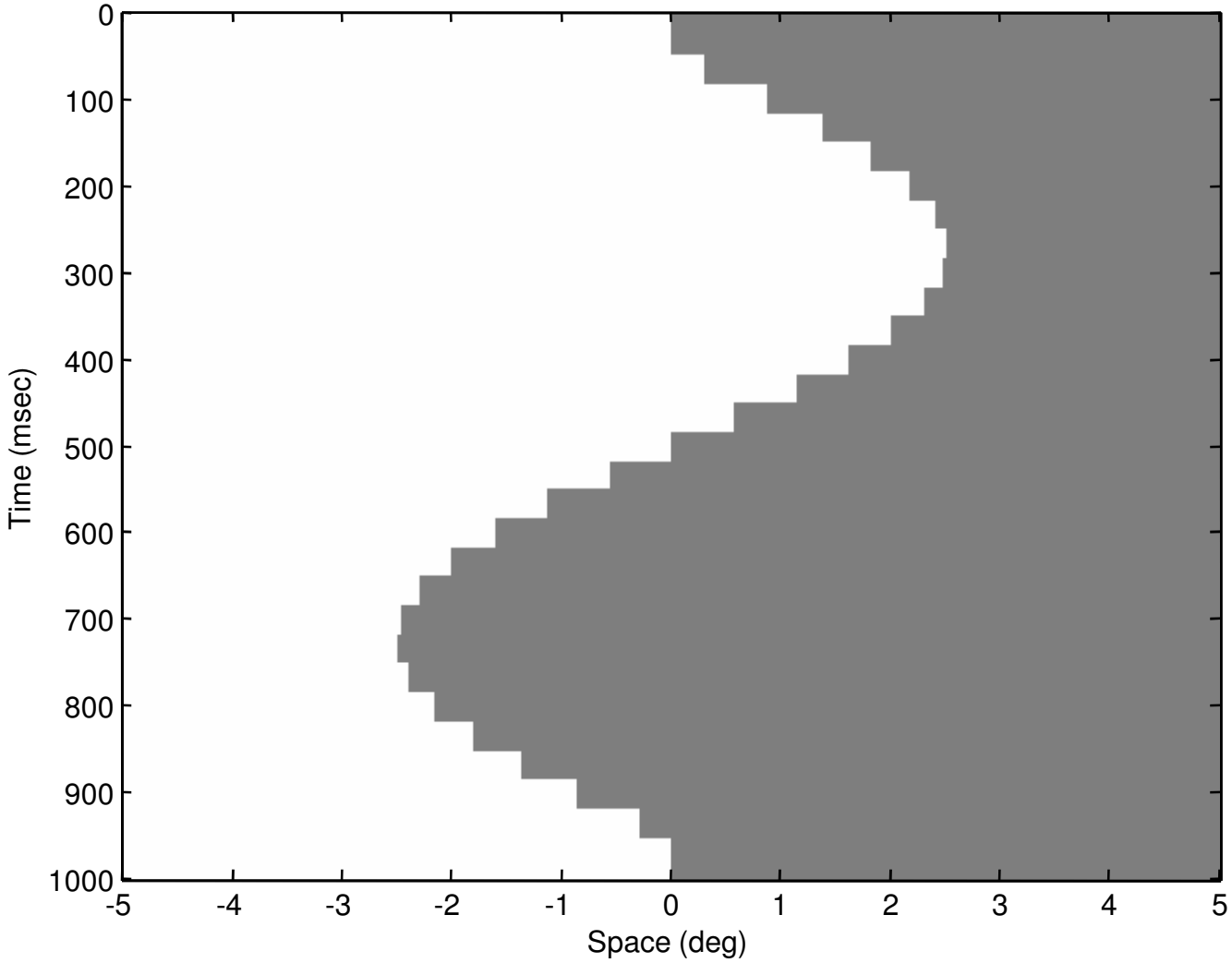




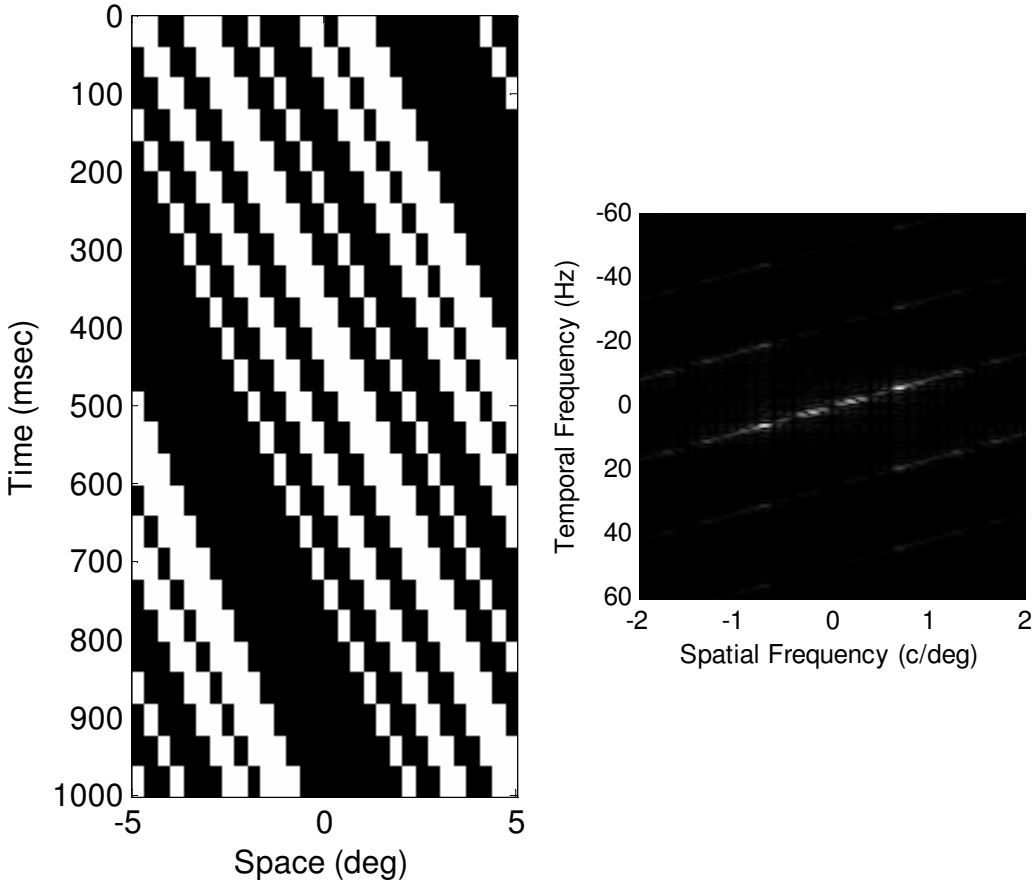
Sinusoidally moving edge



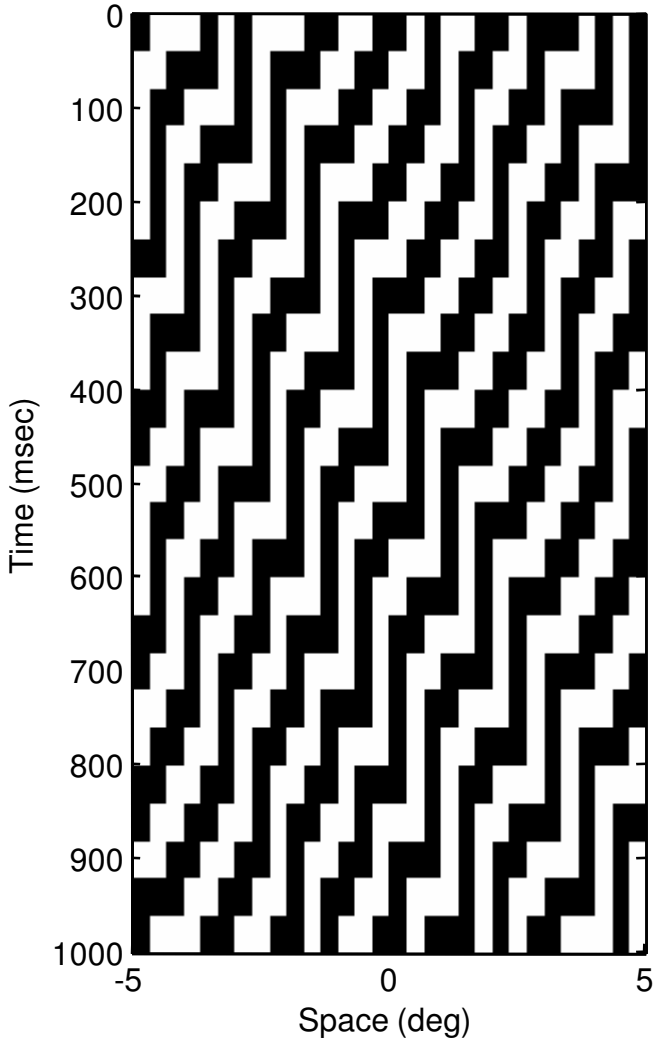
Sampled sinusoidally moving edge (10 Hz)

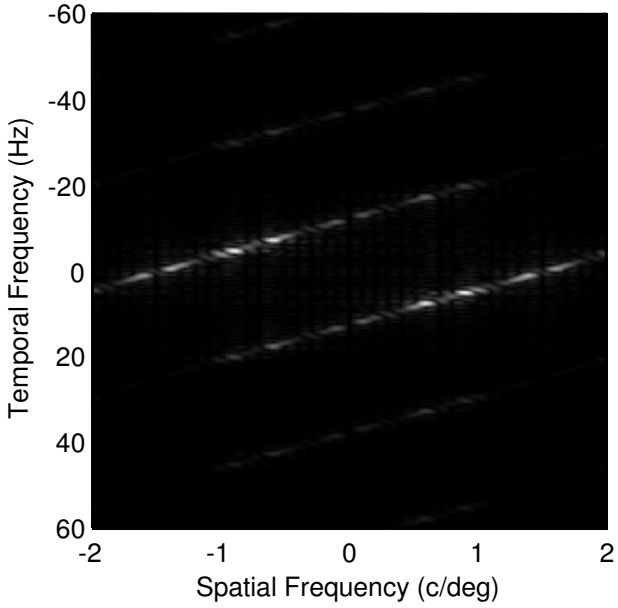


Sampled rightward noise (25 Hz)

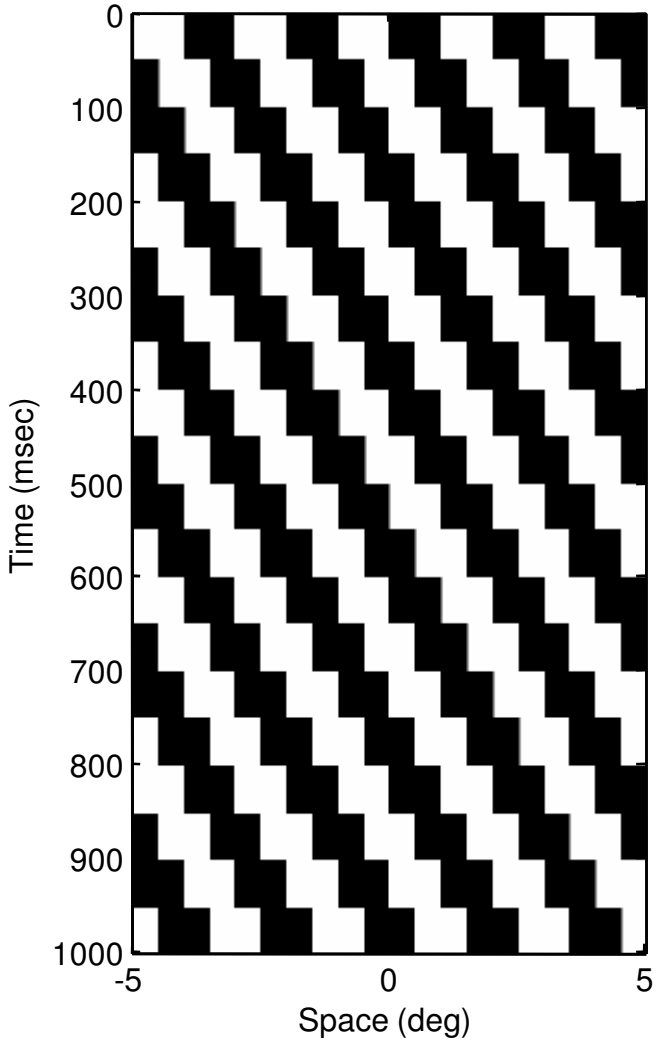


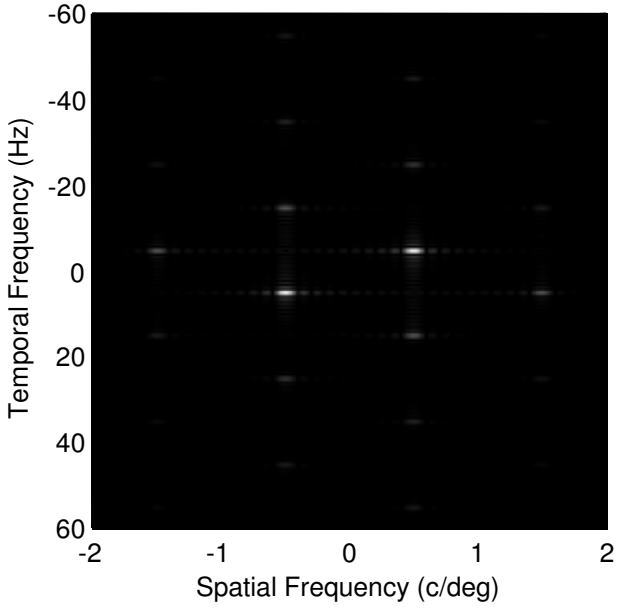
rightward ‘reverse phi’



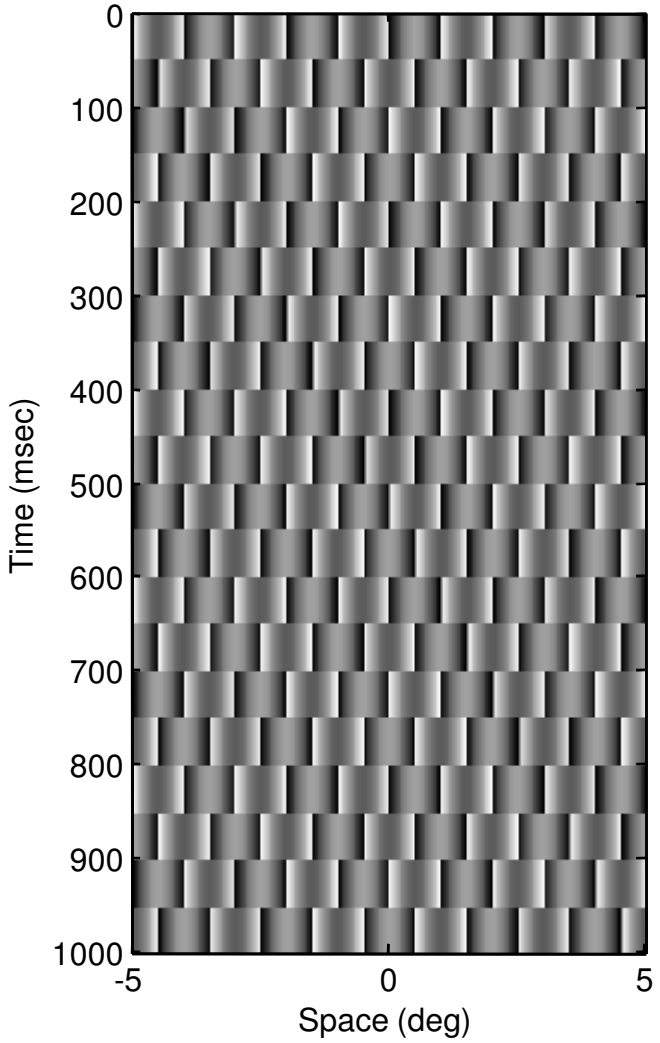


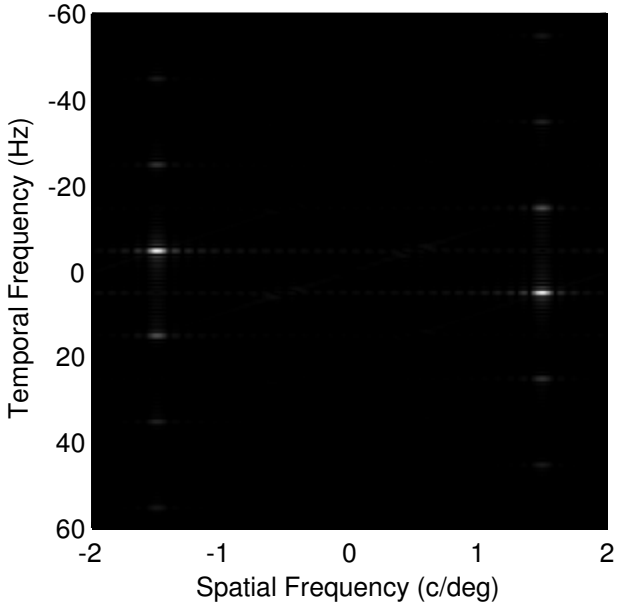
Sampled rightward square wave



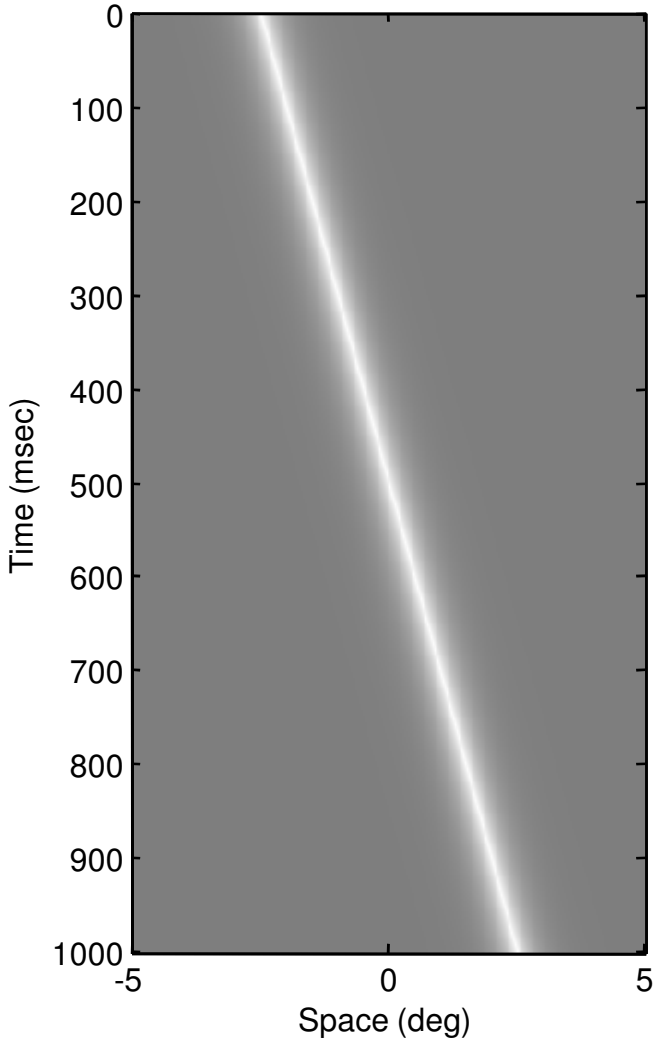


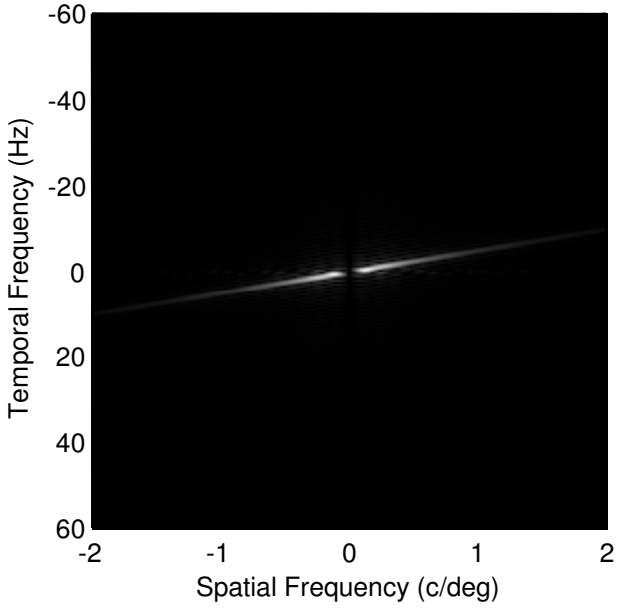
Sampled rightward ‘fluted’ square wave



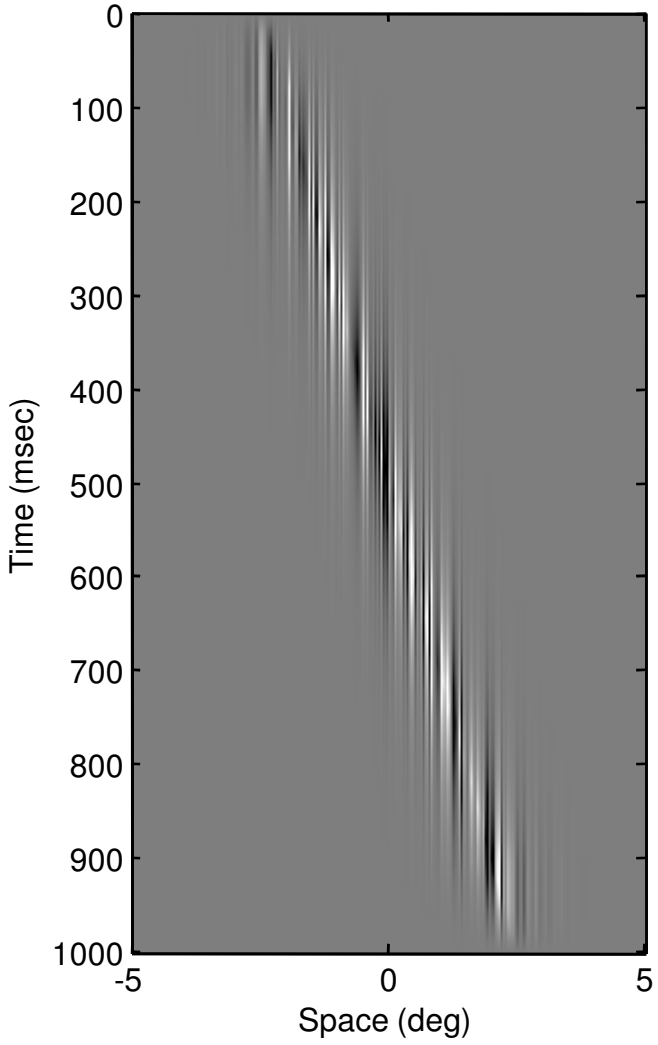


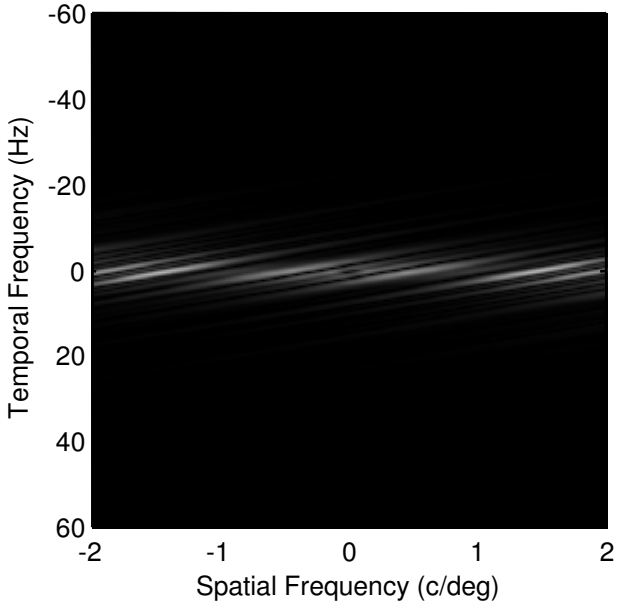
‘First order’ motion

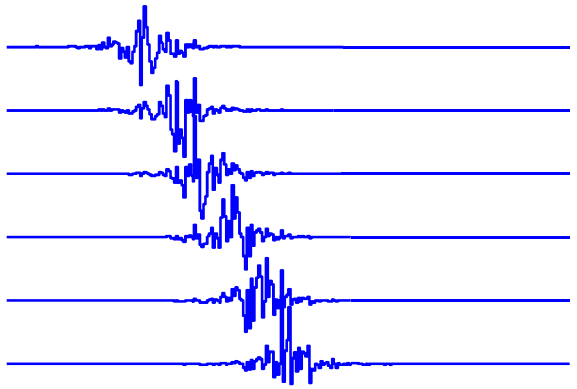




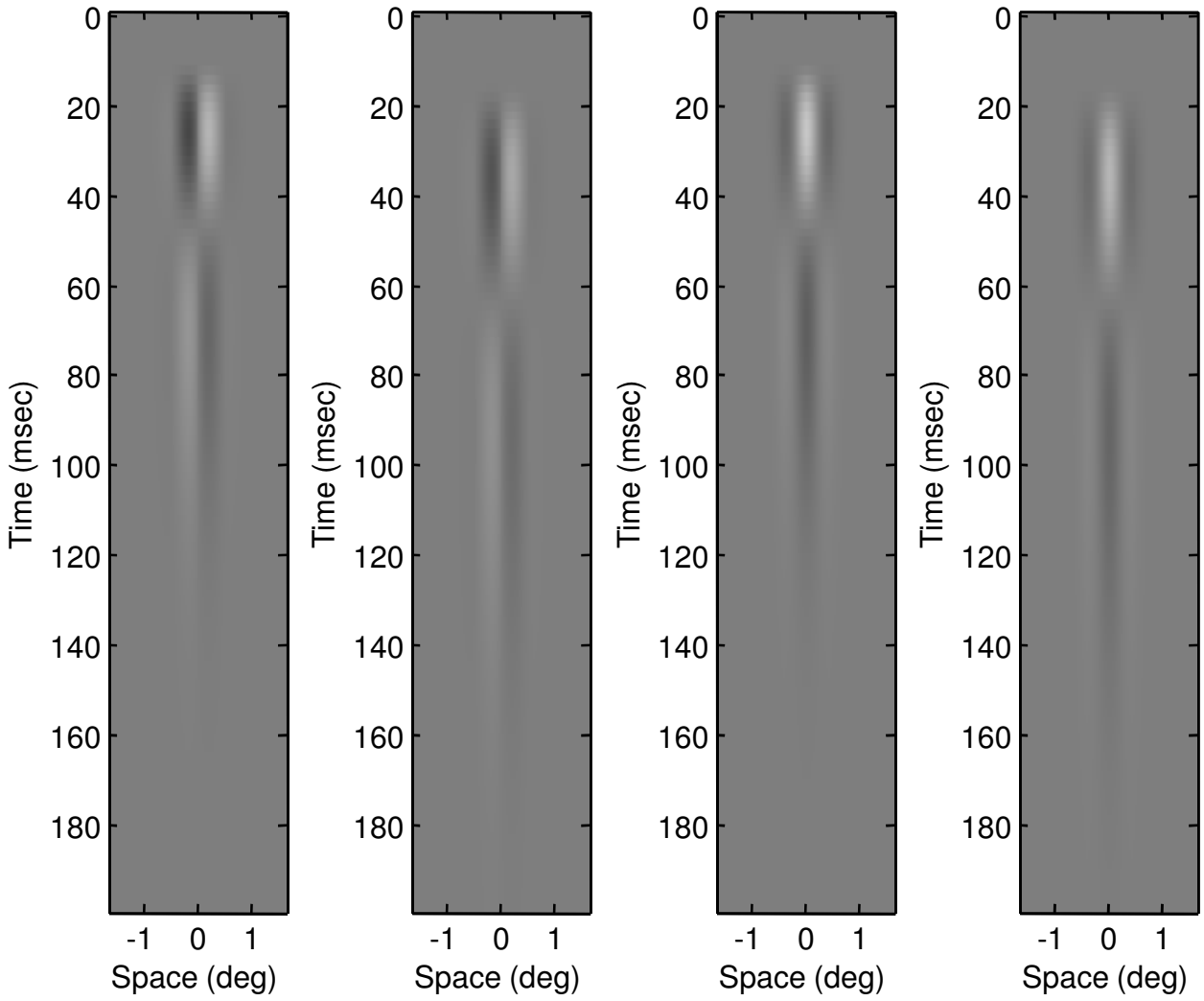
‘Second order’ motion



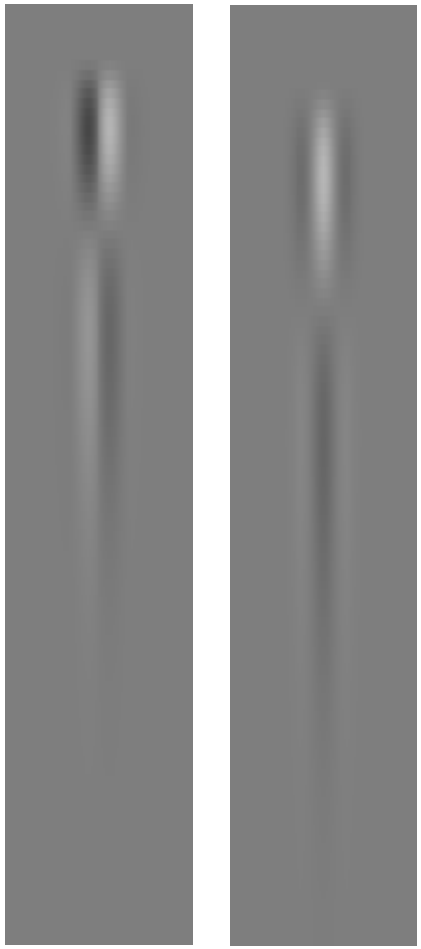


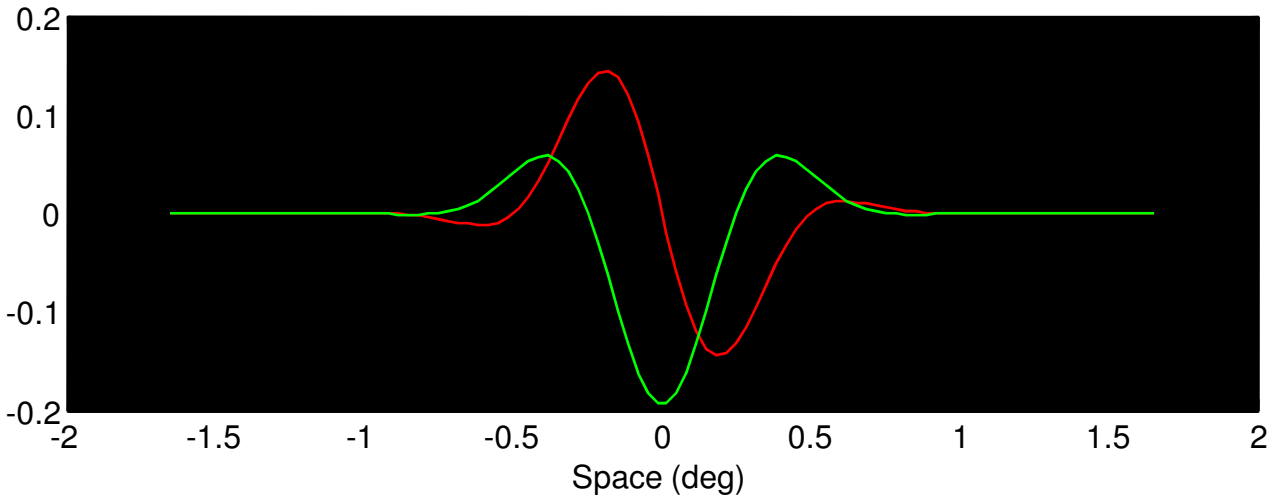


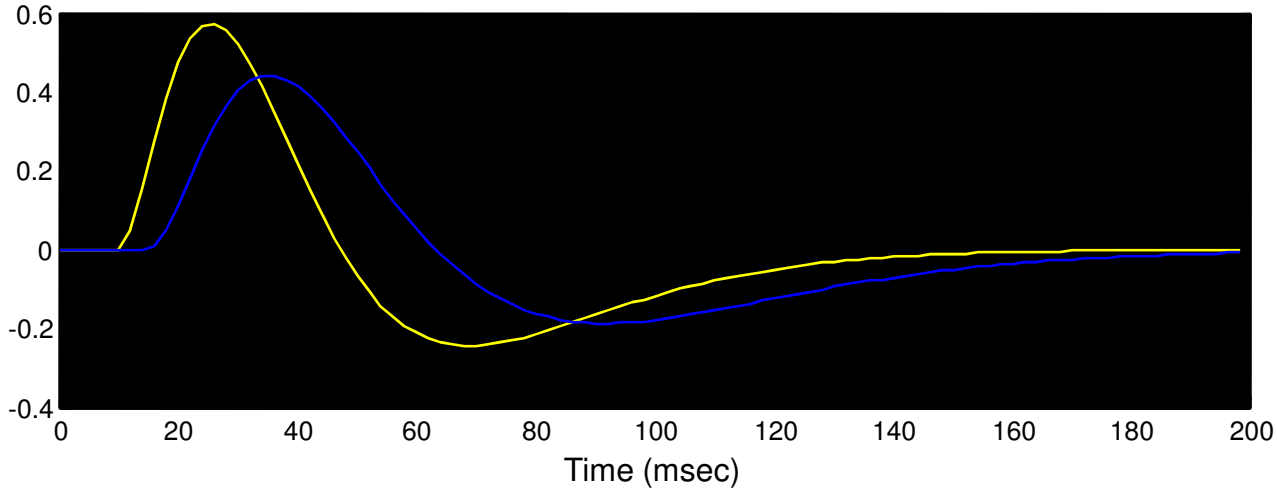
Four separable linear filters



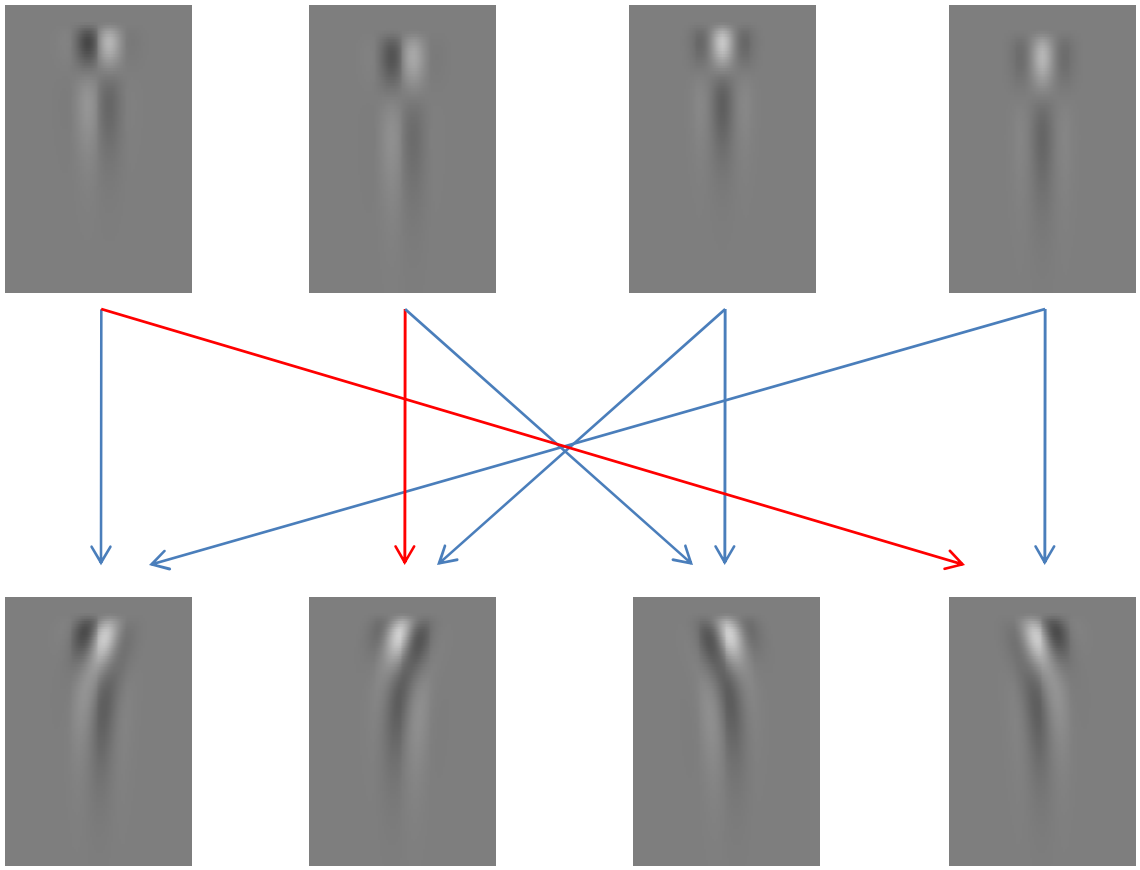
Cross-sections in space and time



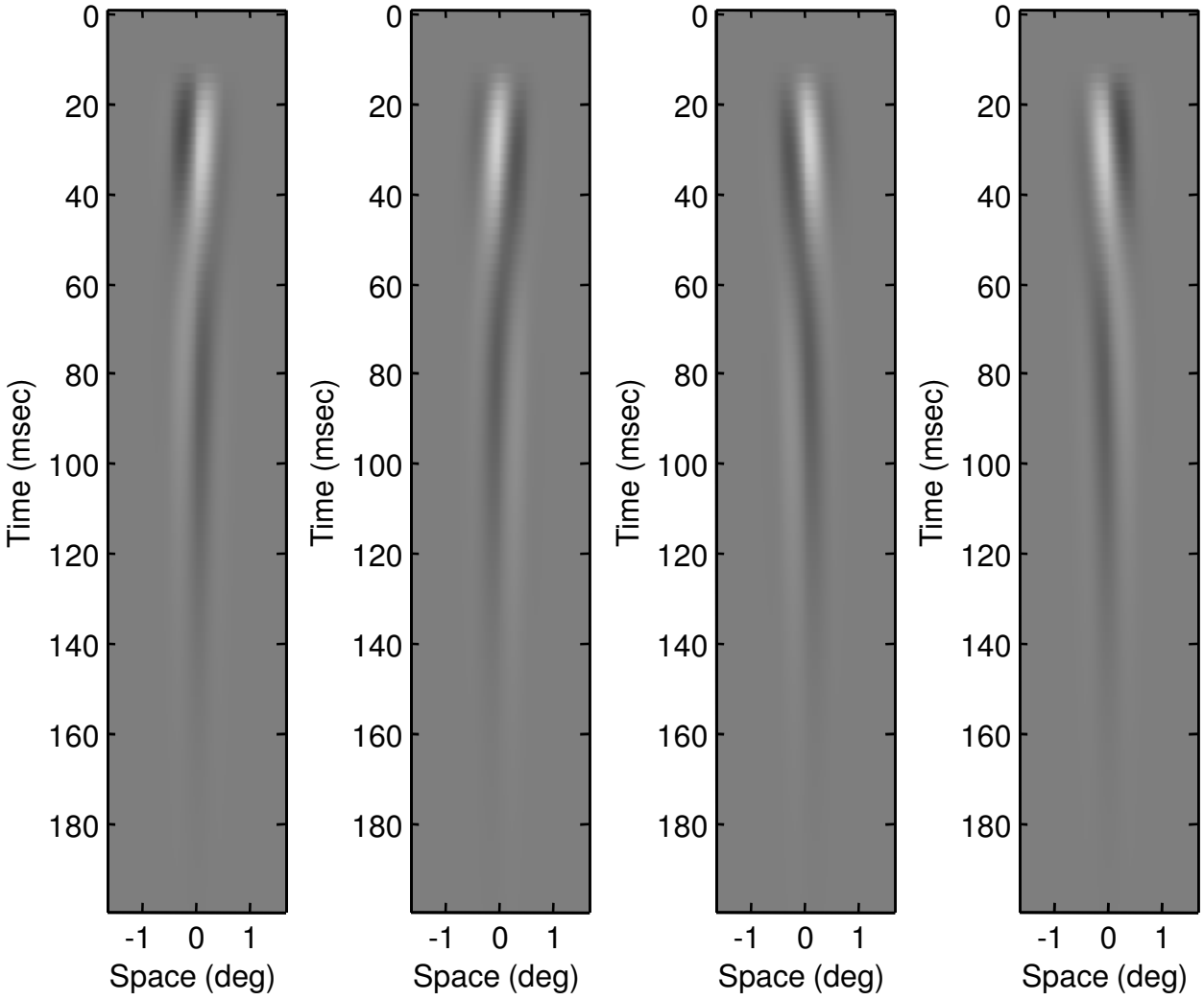




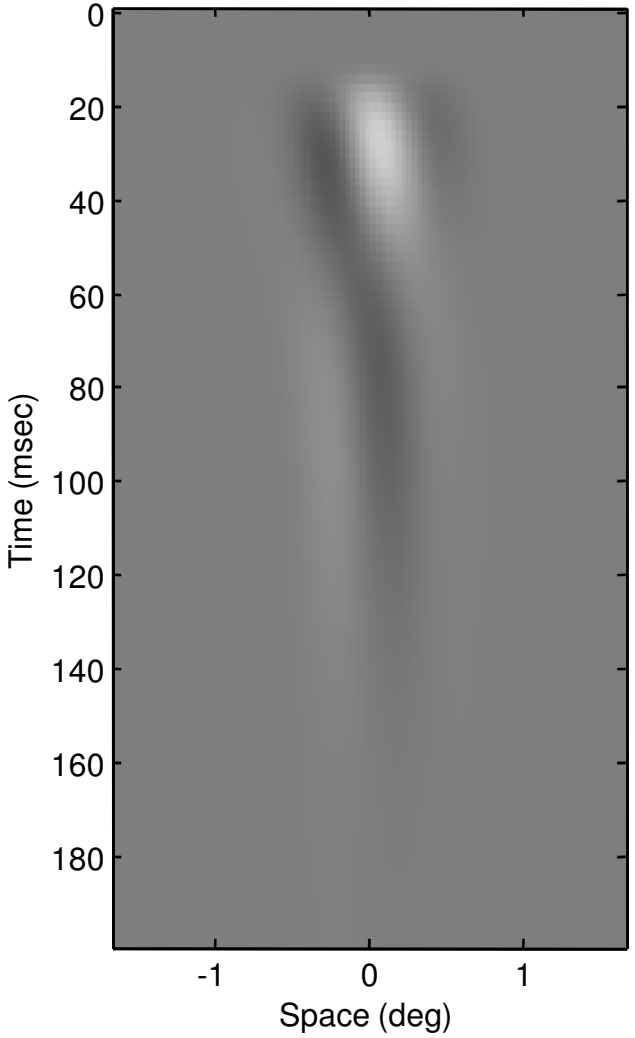
Four space-time oriented filters generated by
adding and subtracting the separable linear filters

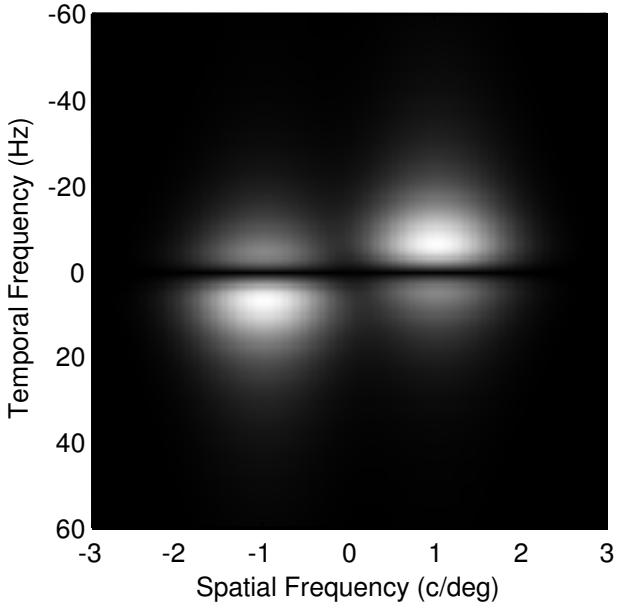


Four space-time oriented filters generated by
adding and subtracting the separable linear filters

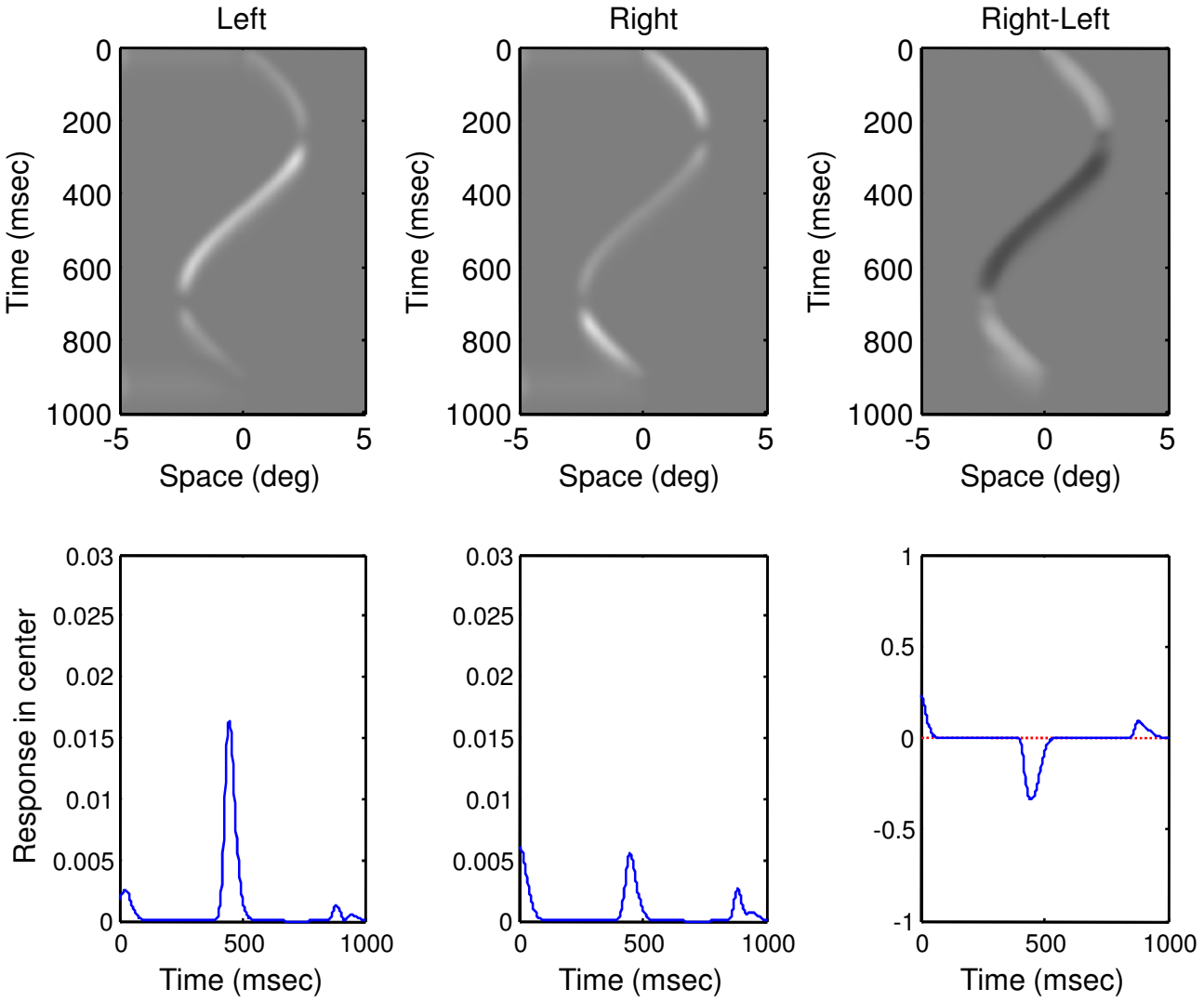


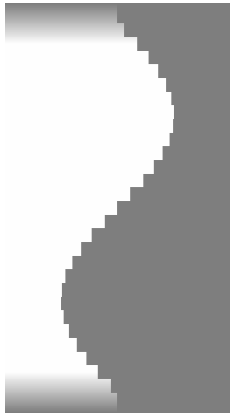
Space-time oriented filters in the space and Fourier domain



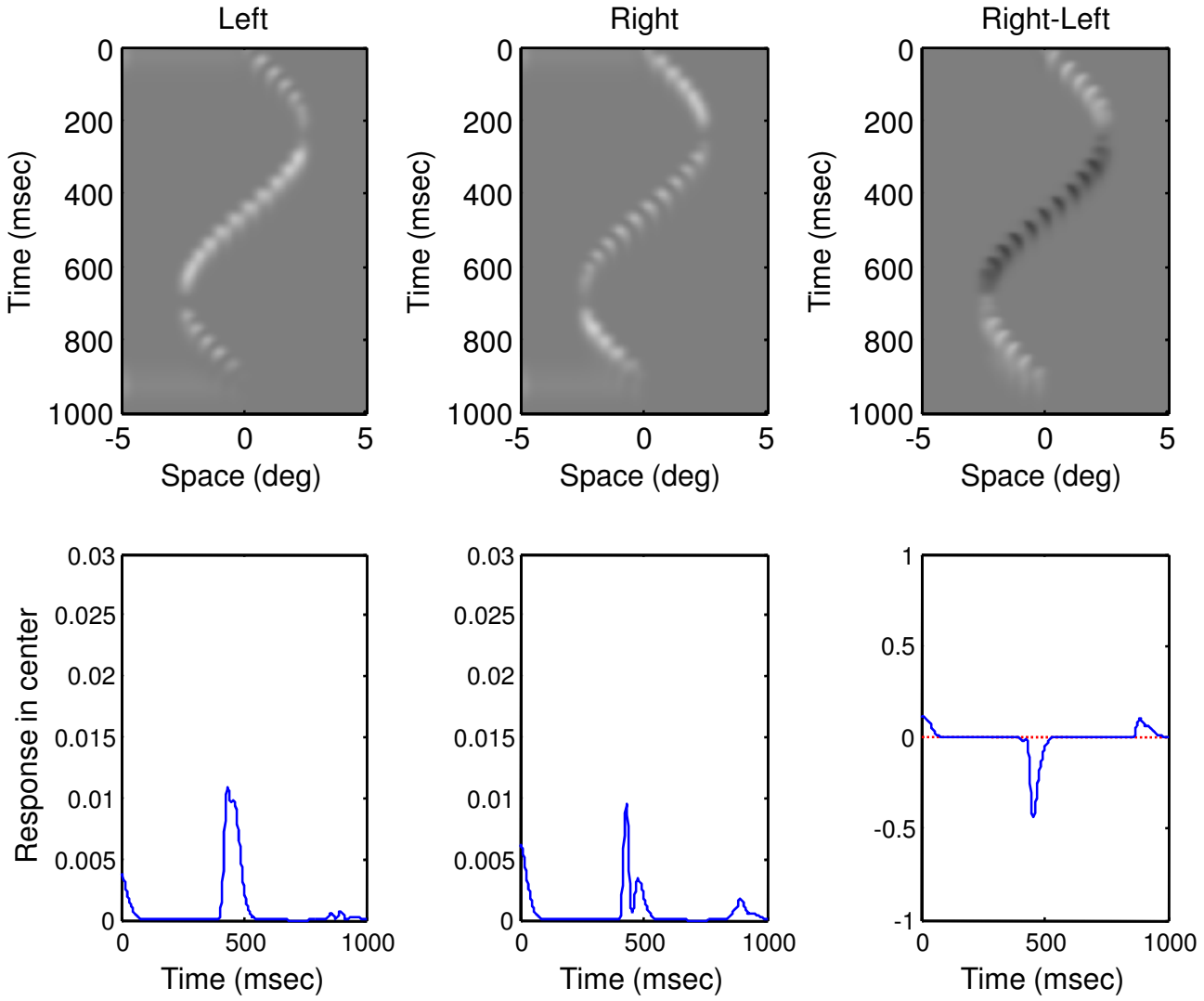


Response of ‘Energy mechanisms’ to a moving sinusoidal edge

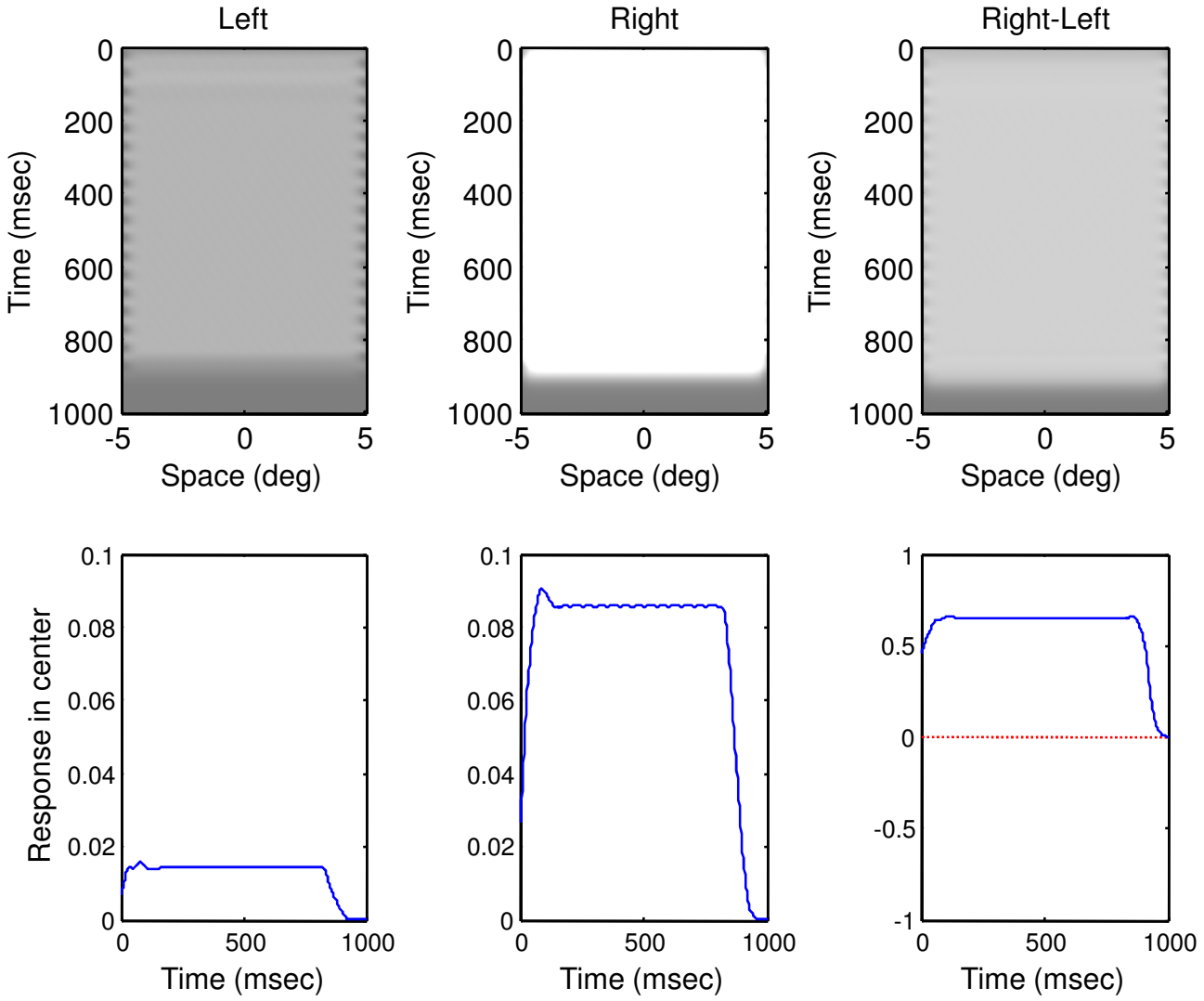




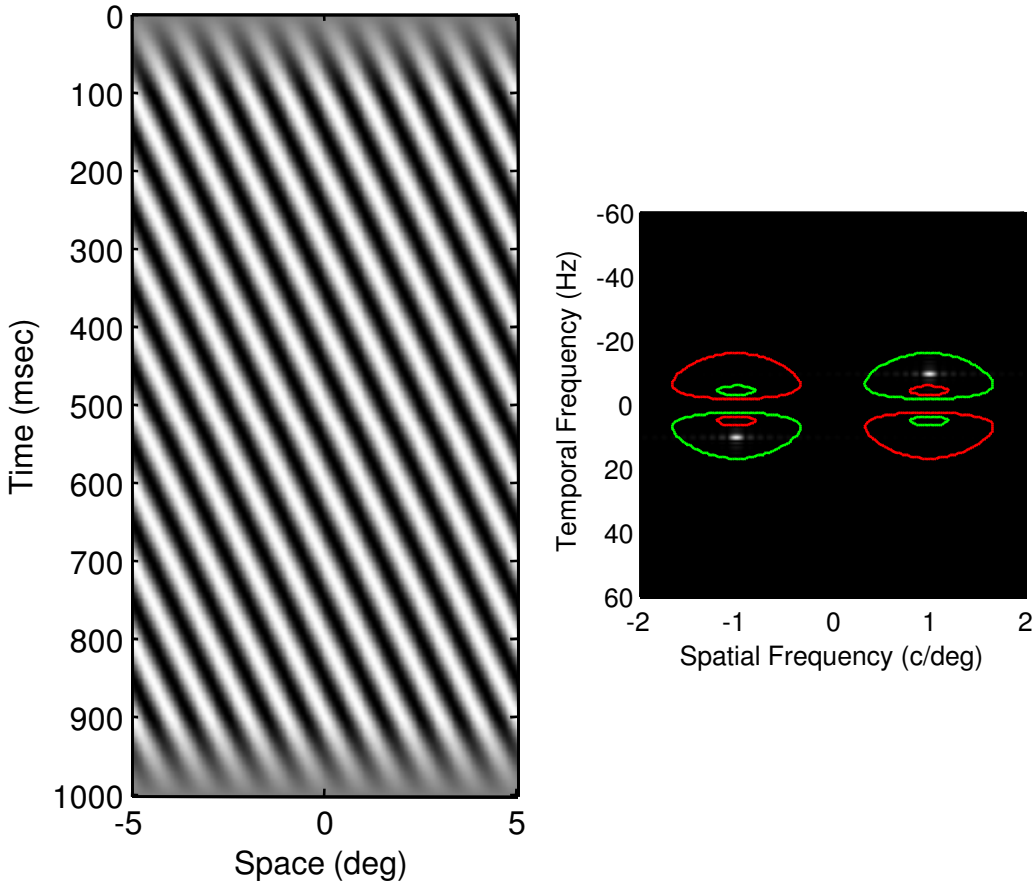
Response of ‘Energy mechanisms’ to a sampled moving sinusoidal edge

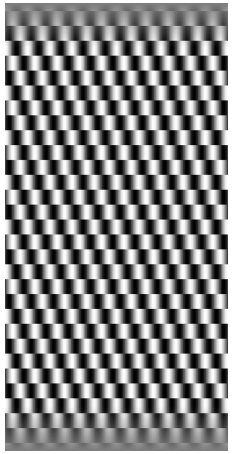


Response of ‘Energy mechanisms’ to a moving grating

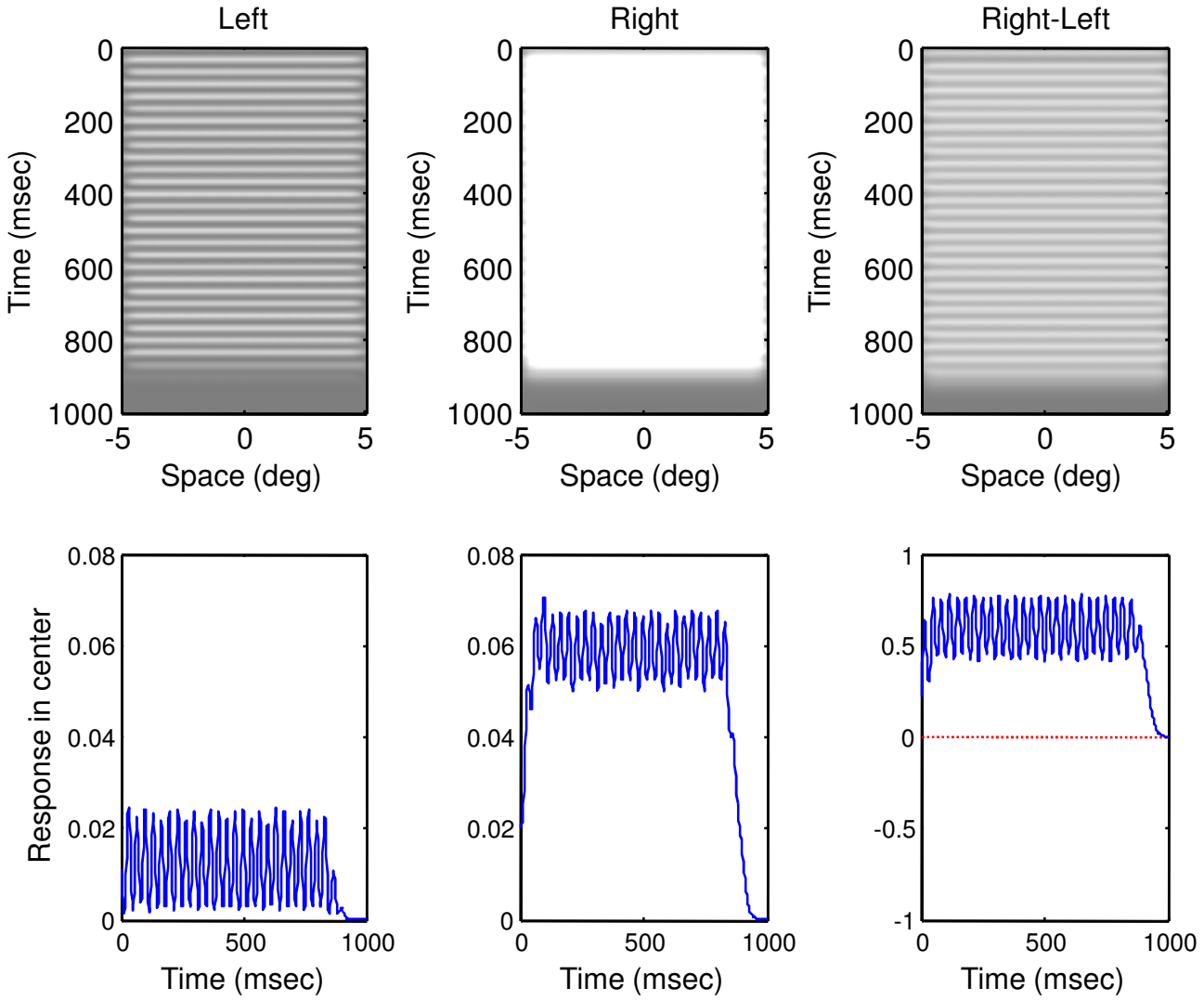


Response of ‘Energy mechanisms’ to a moving grating

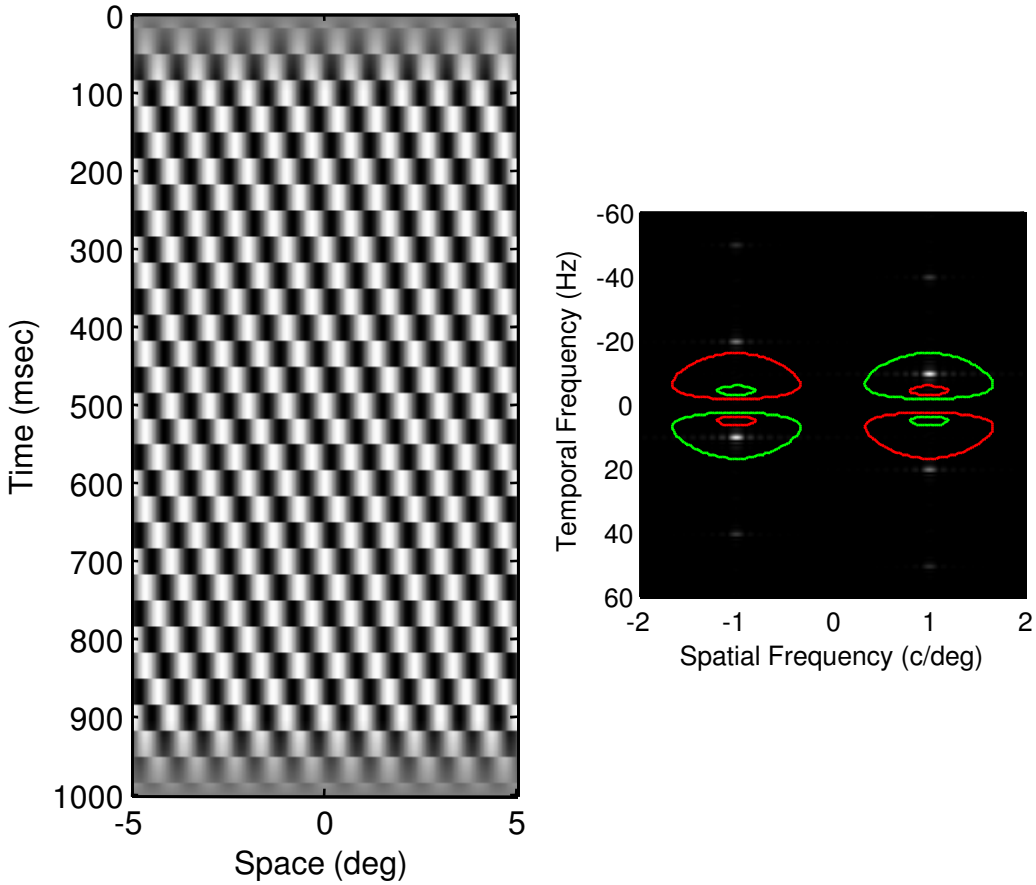




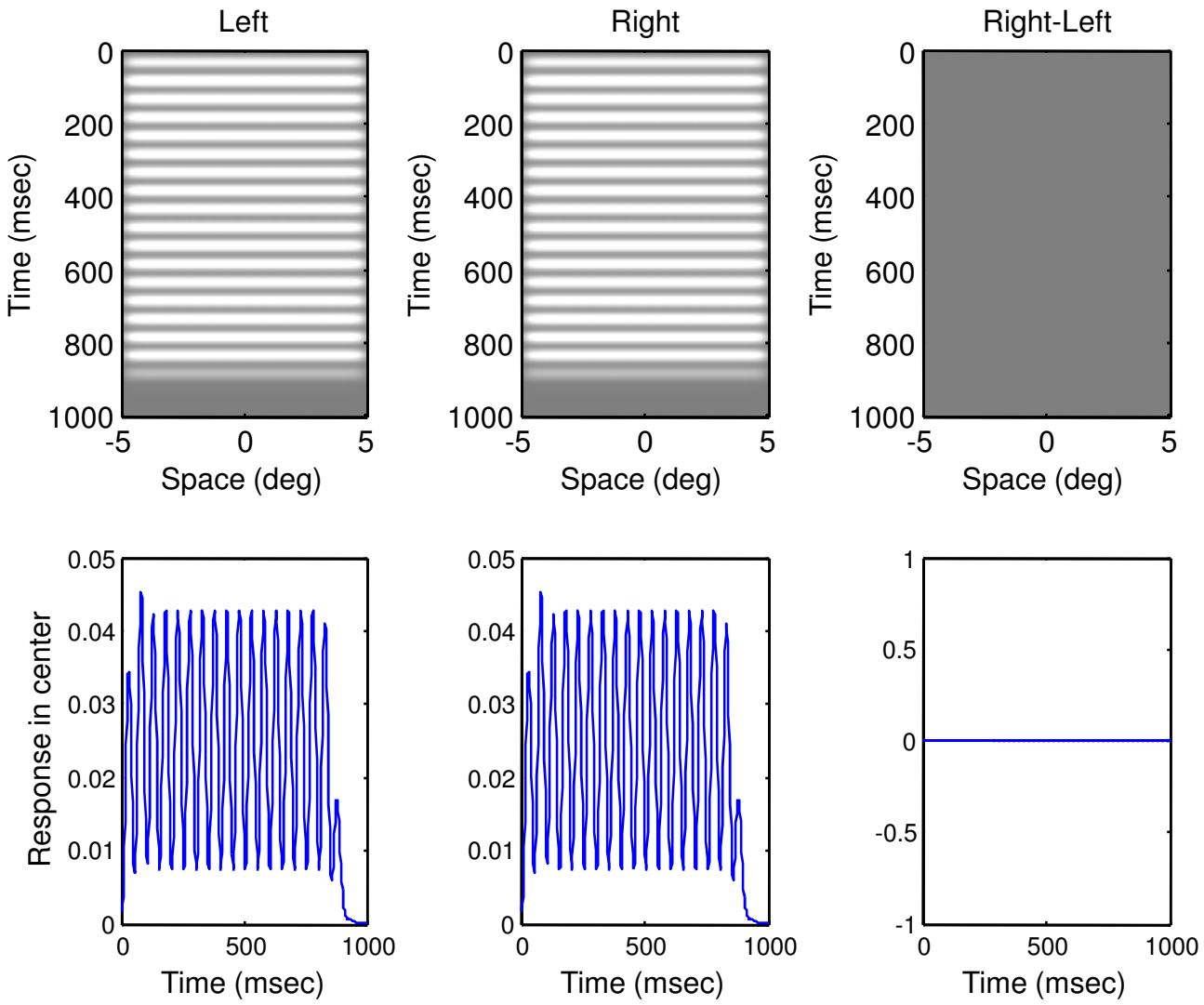
Response of ‘Energy mechanisms’ to a sampled moving grating



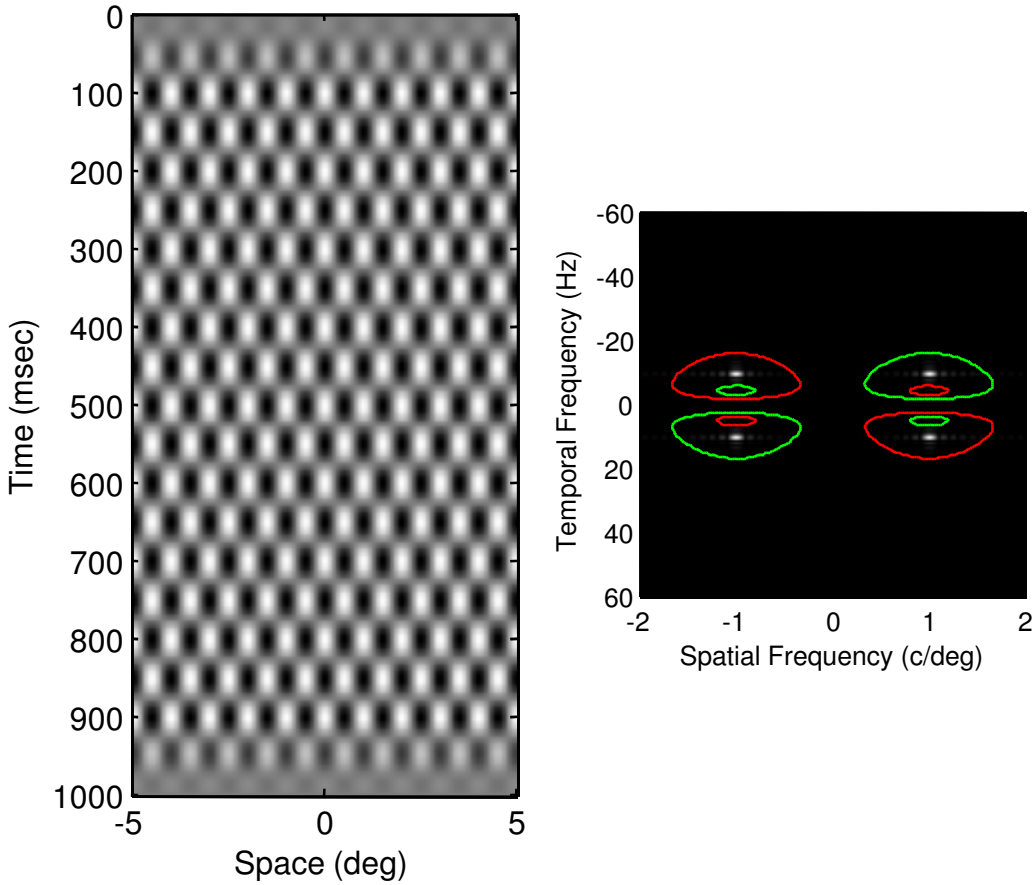
Response of ‘Energy mechanisms’ to a sampled moving grating

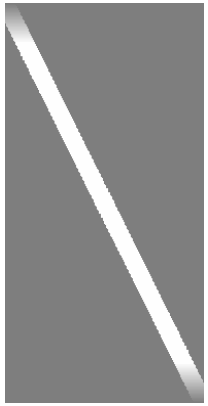


Response of ‘Energy mechanisms’ to counterphase grating

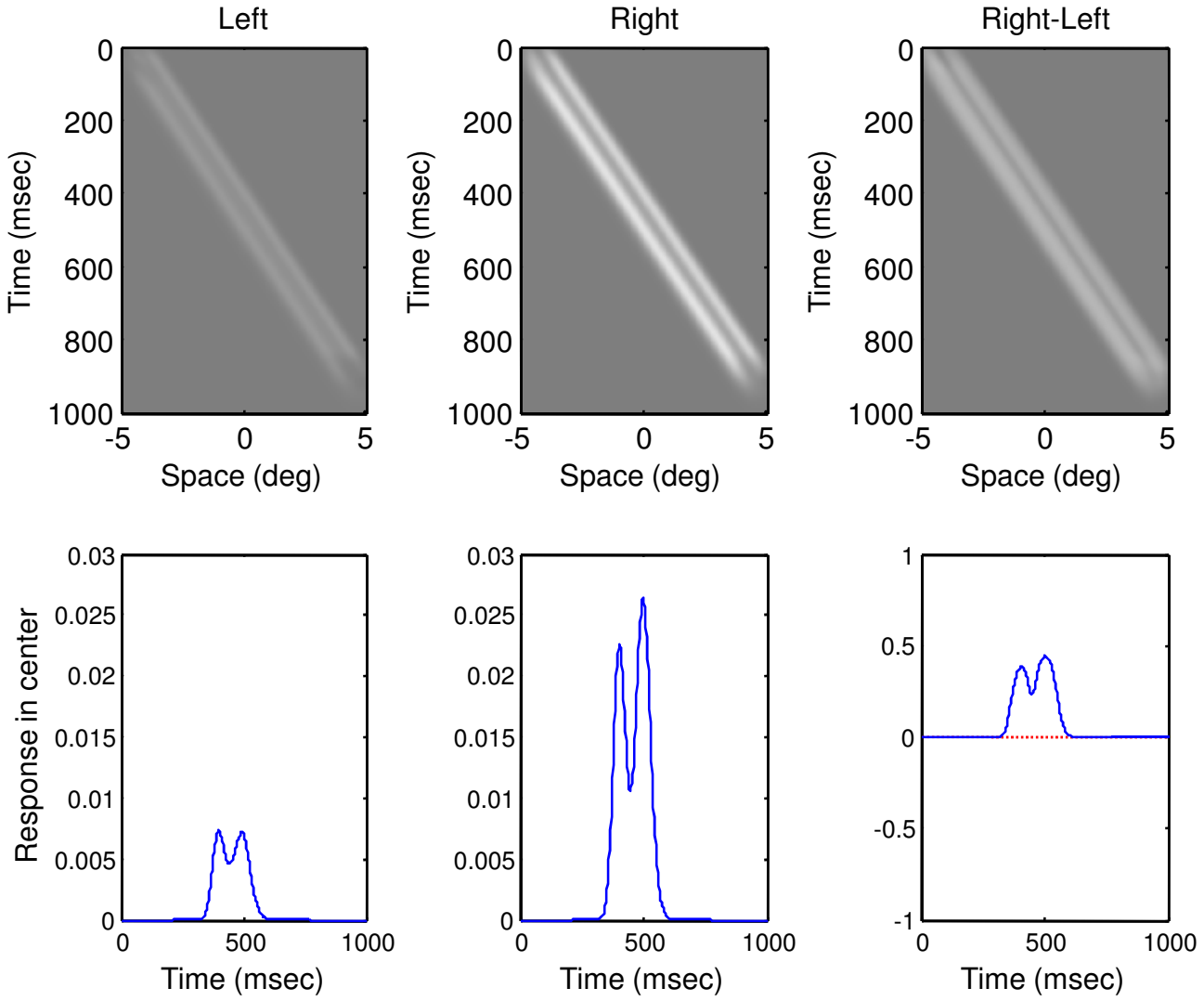


Response of ‘Energy mechanisms’ to counterphase grating

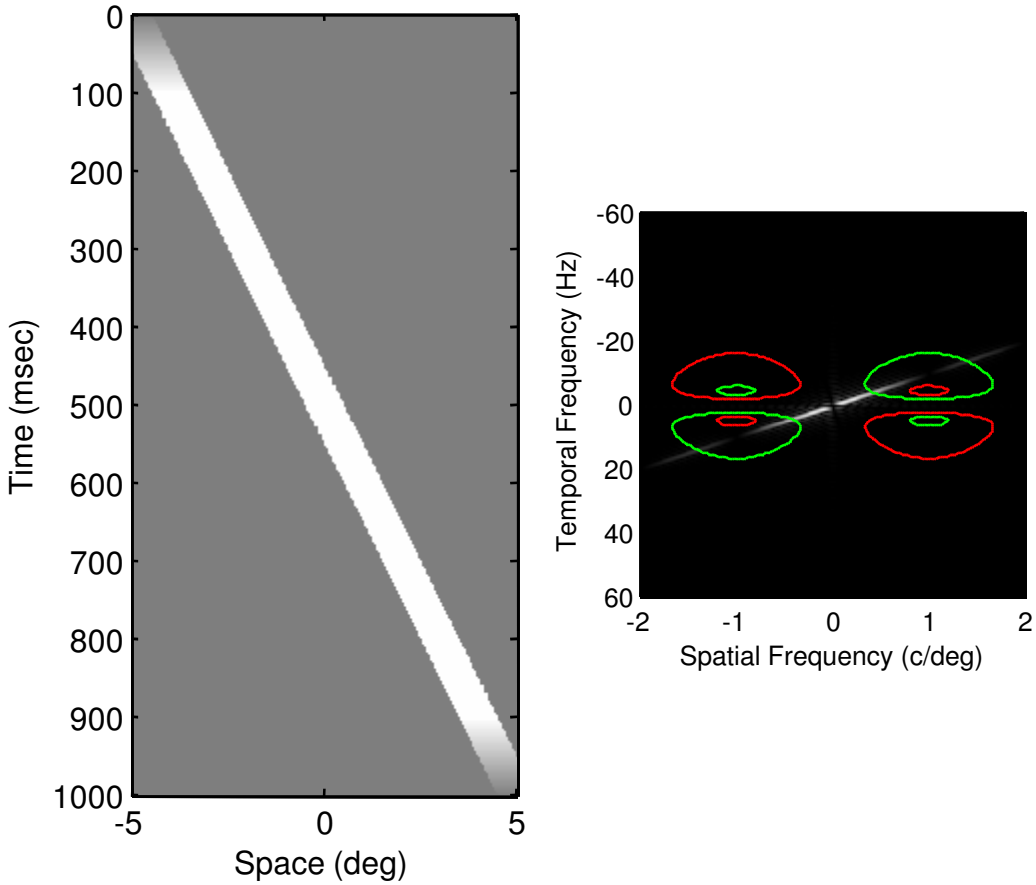


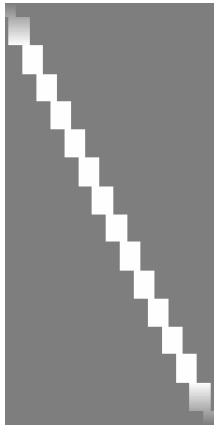


Response of ‘Energy mechanisms’ to a smoothly moving bar

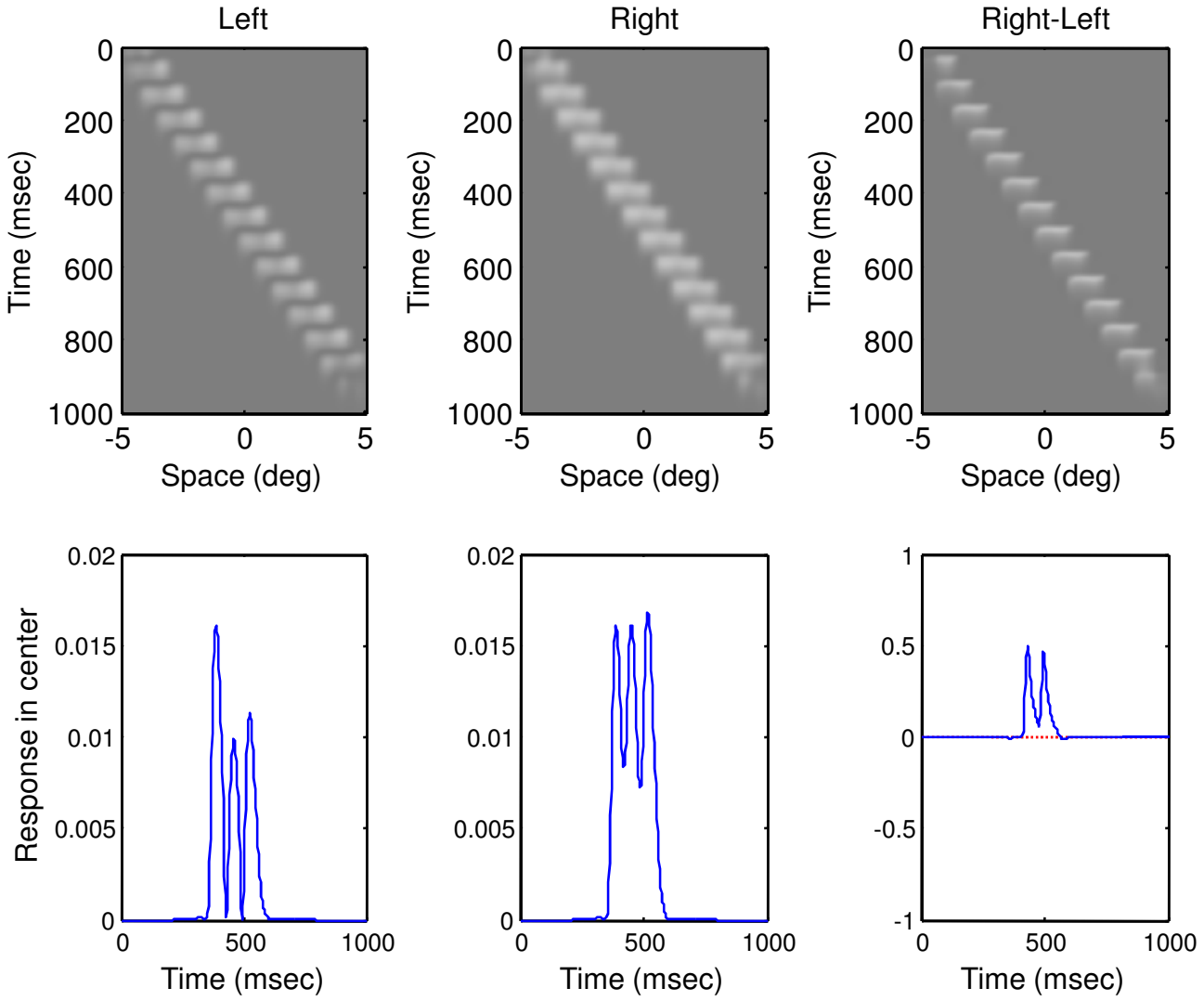


Response of ‘Energy mechanisms’ to a smoothly moving bar

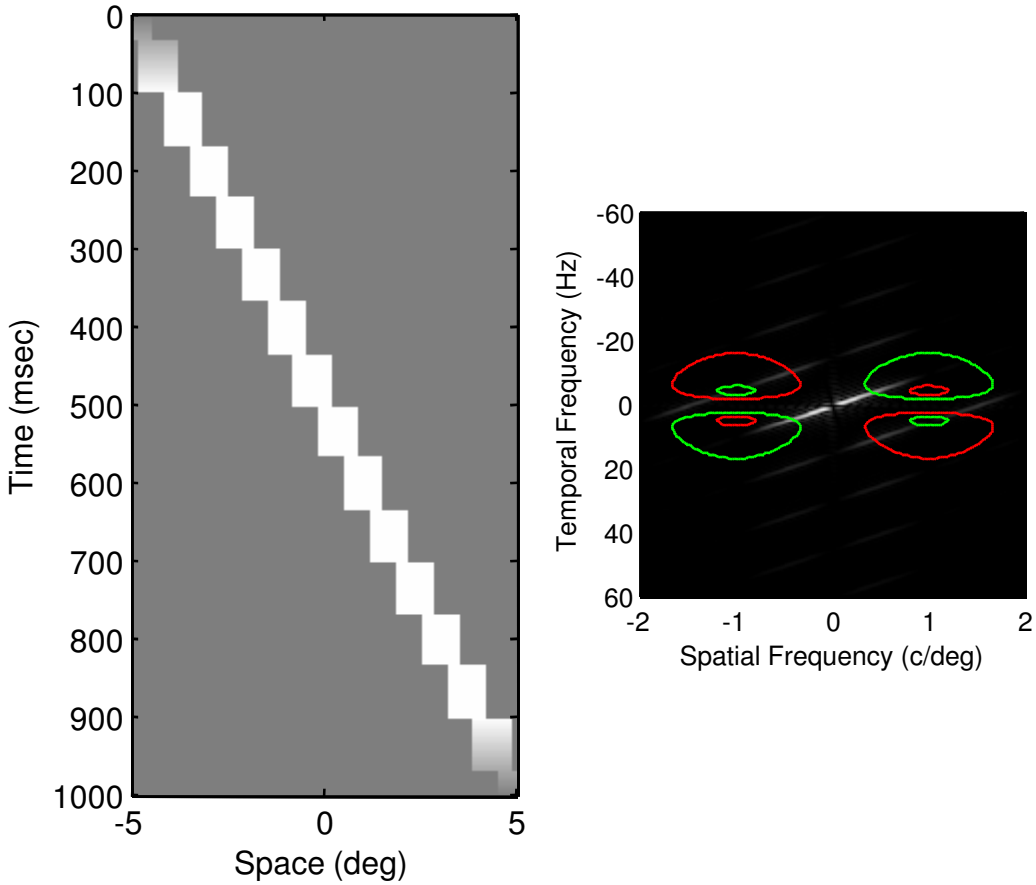


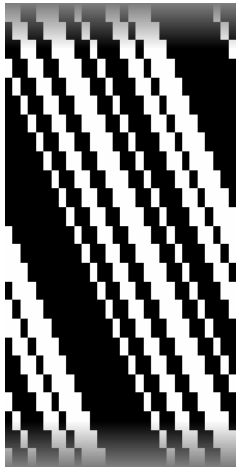


Response of ‘Energy mechanisms’ to a sampled moving bar

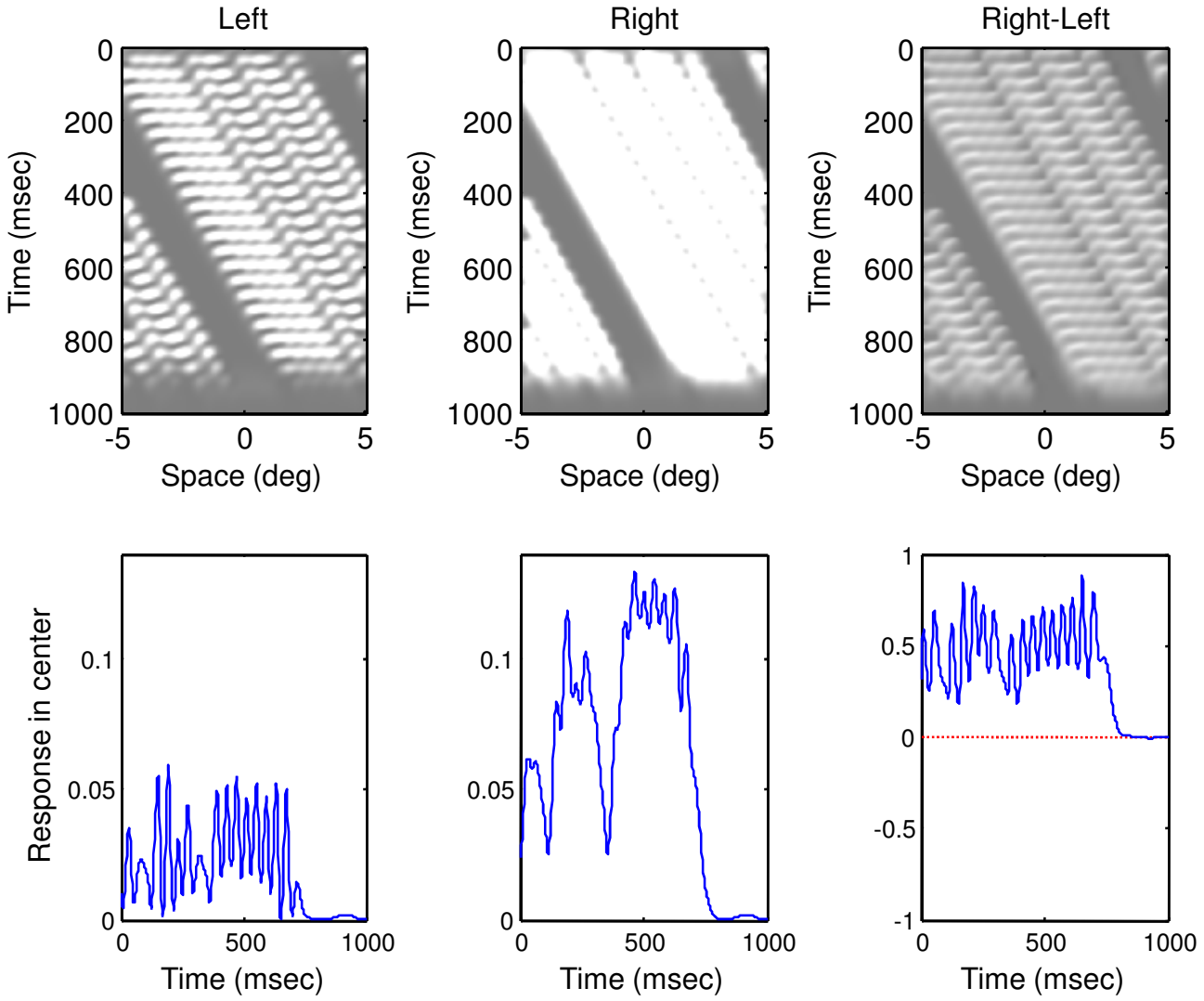


Response of ‘Energy mechanisms’ to a sampled moving bar

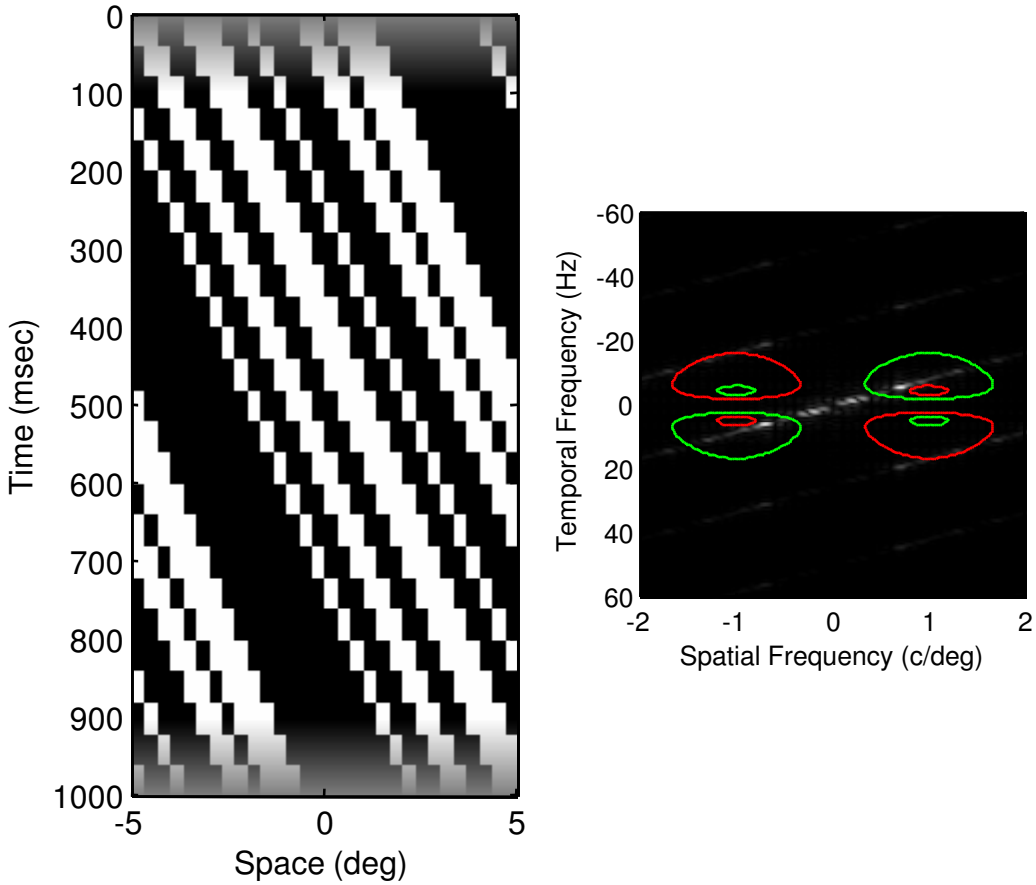


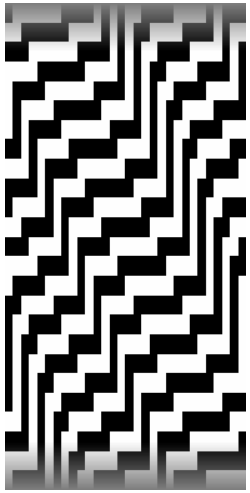


Response of ‘Energy mechanisms’ to rightward moving noise

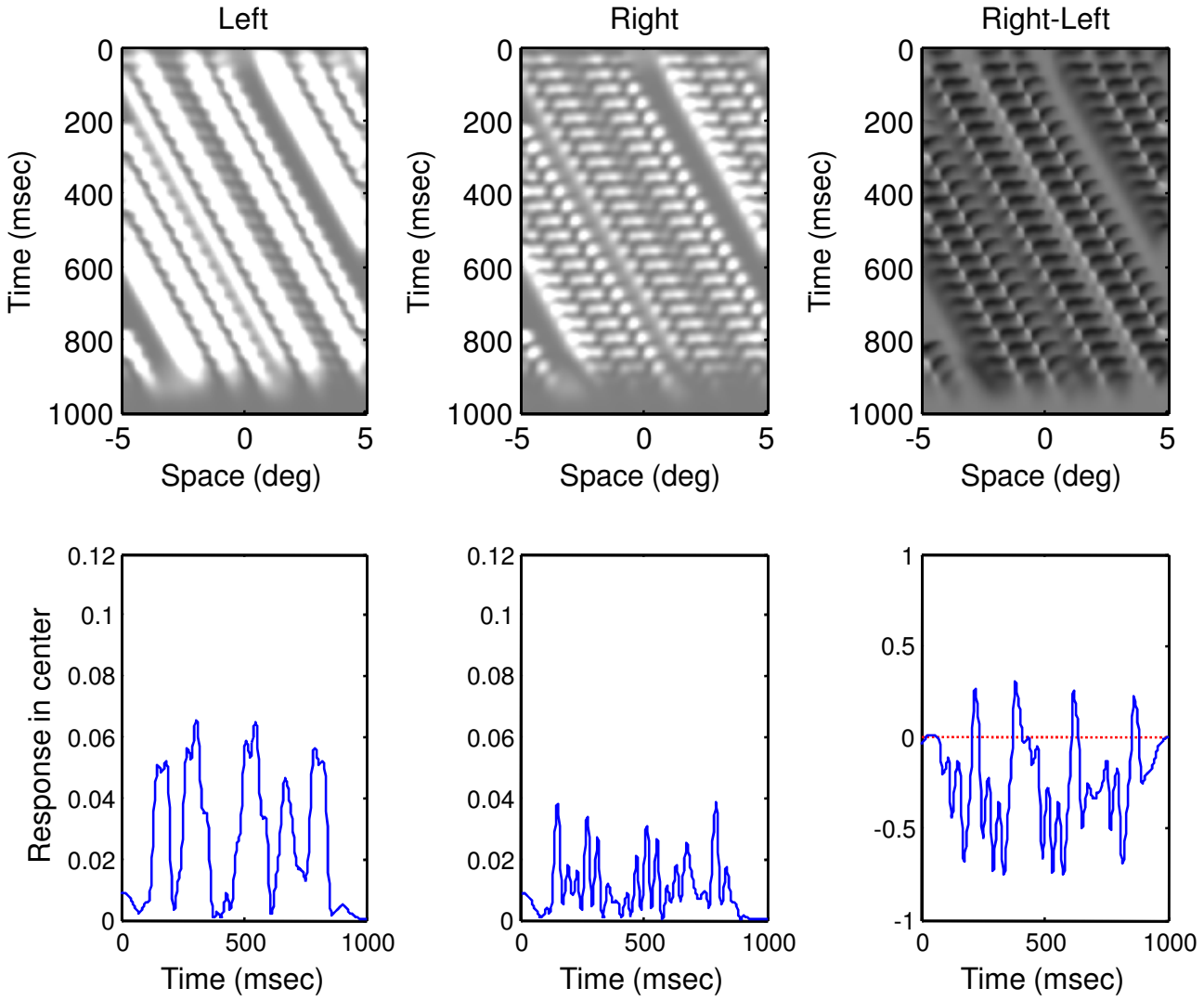


Response of ‘Energy mechanisms’ to rightward moving noise

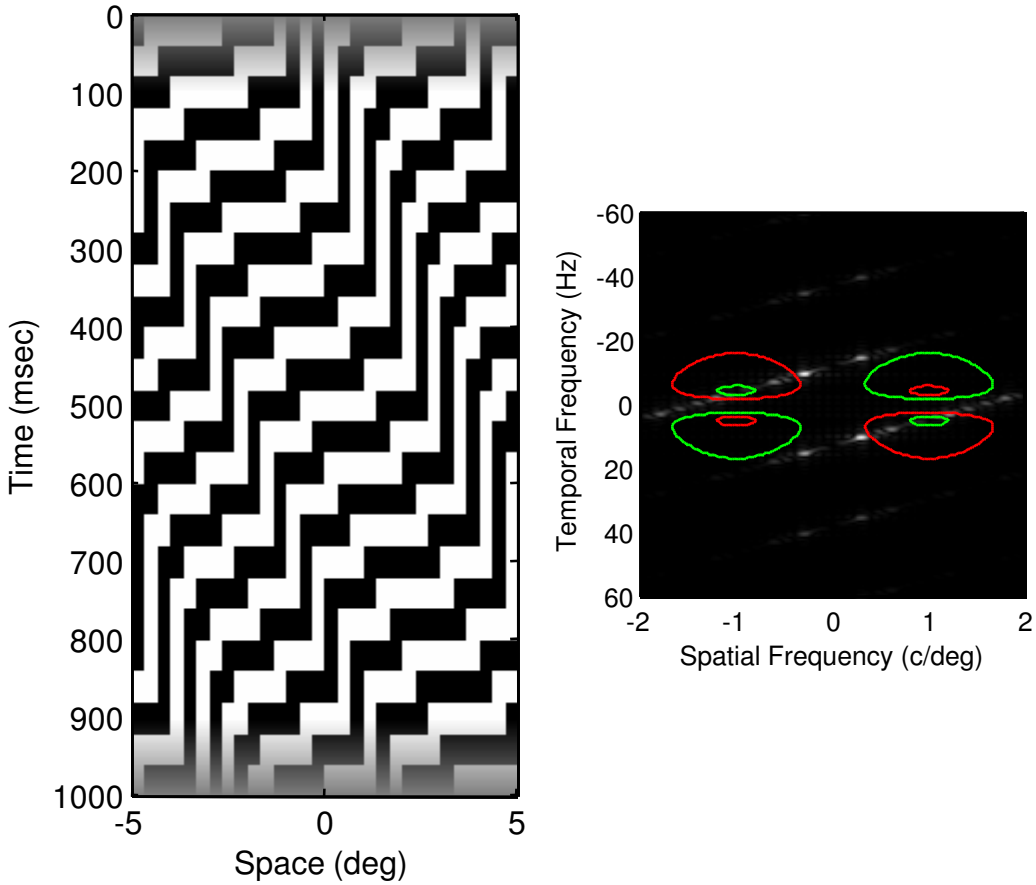




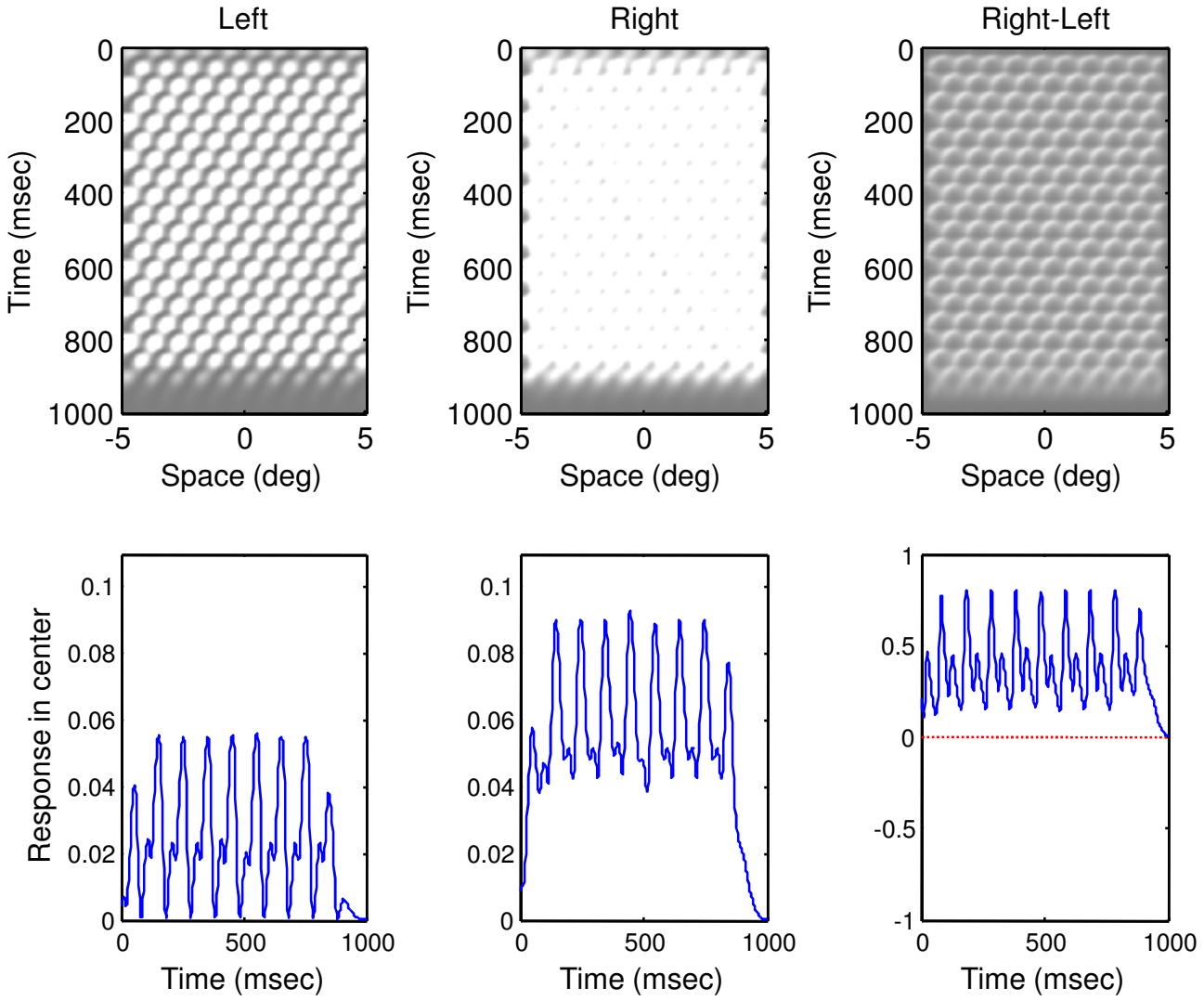
Response of ‘Energy mechanisms’ to a rightward reverse phi stimulus



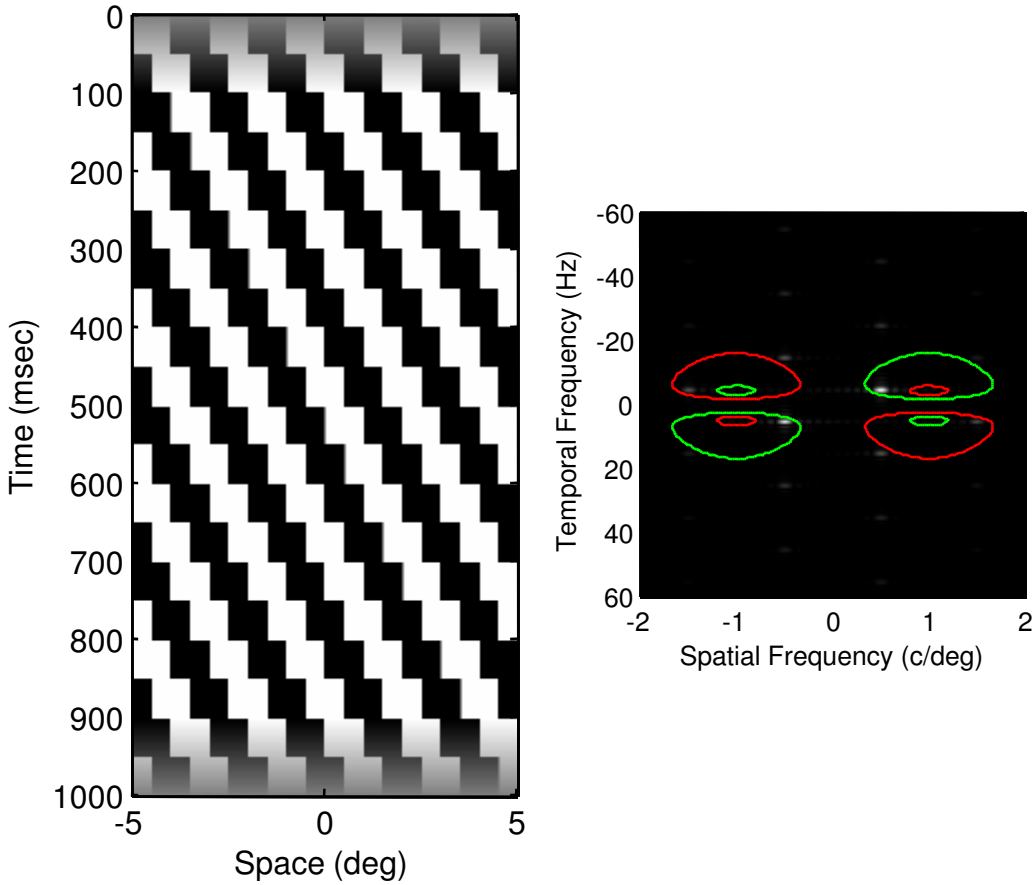
Response of ‘Energy mechanisms’ to a rightward reverse phi stimulus

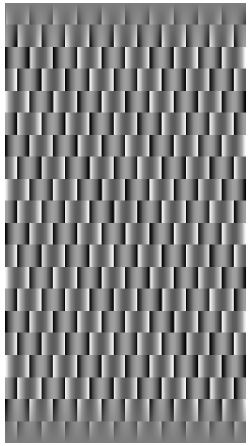


Response of ‘Energy mechanisms’ to a sampled rightward moving square wave

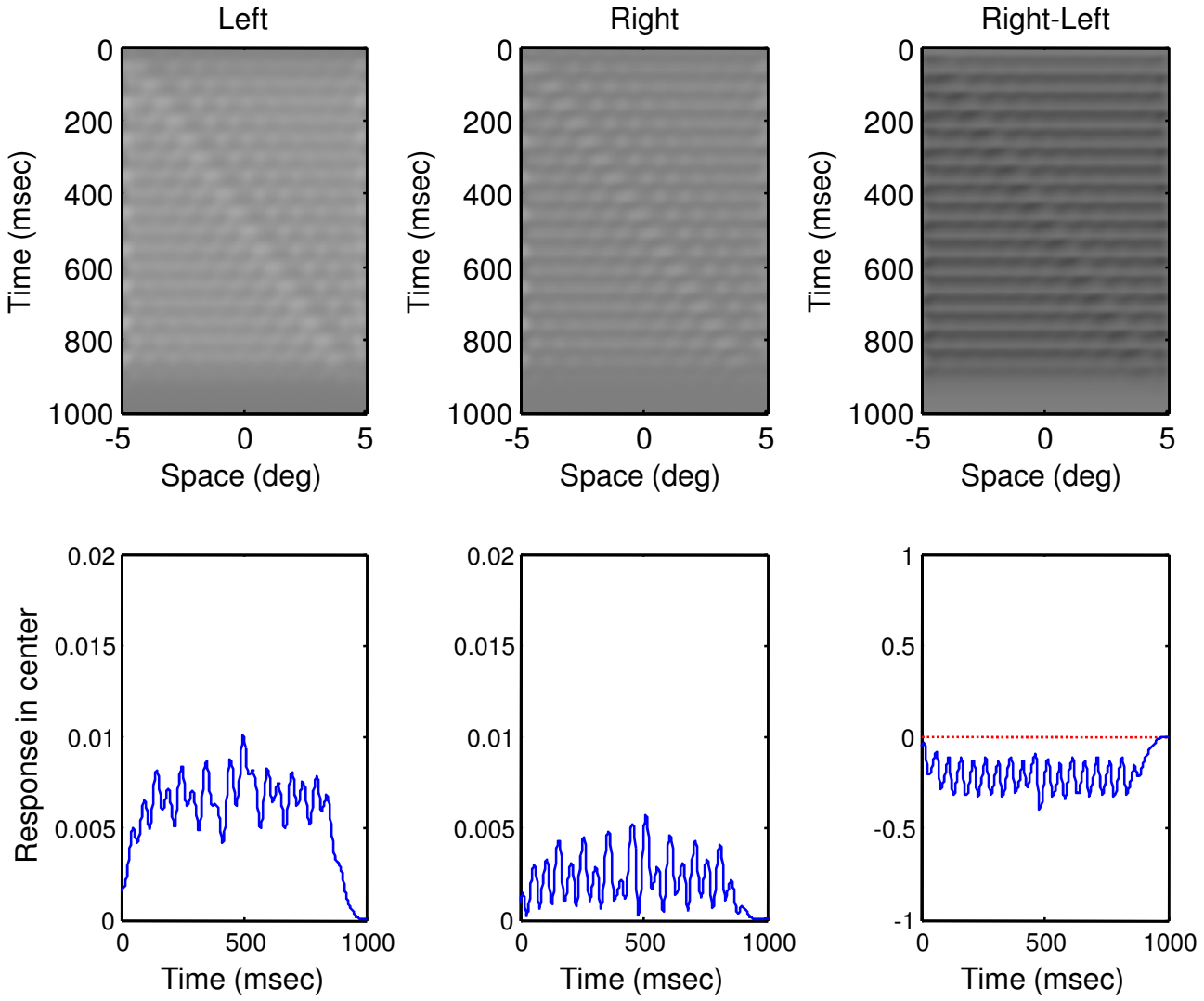


Response of ‘Energy mechanisms’ to a sampled rightward moving square wave

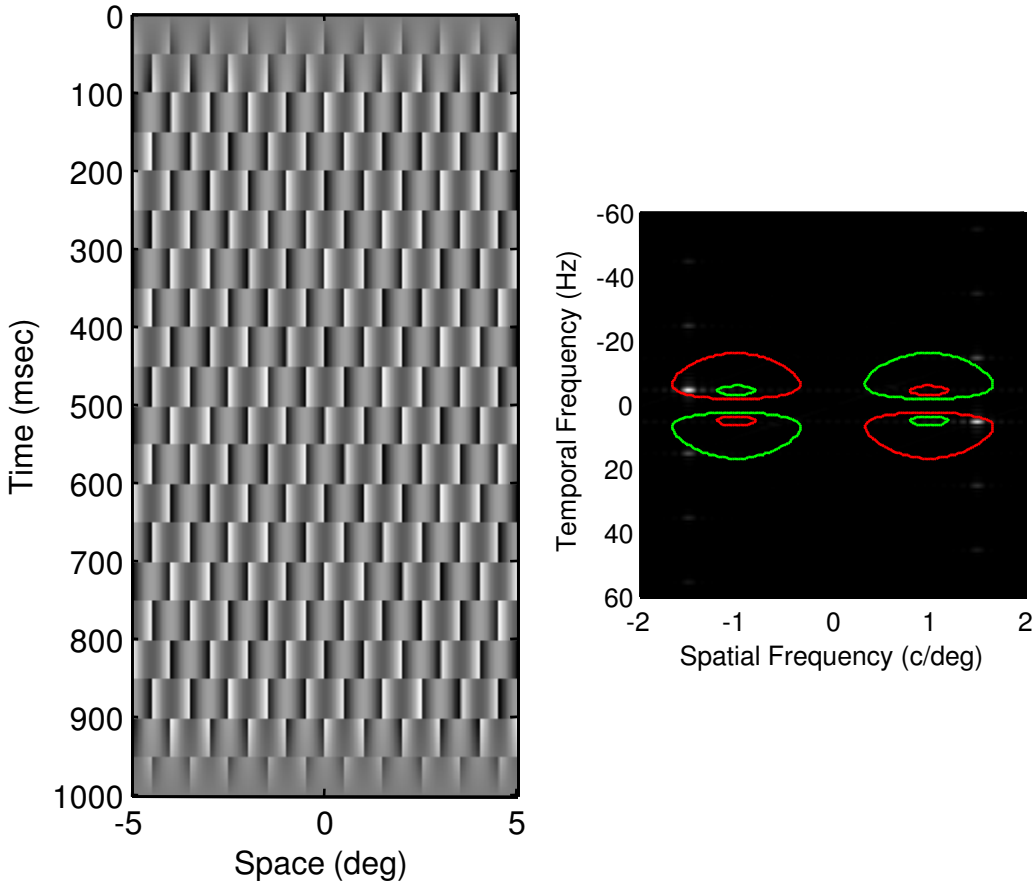


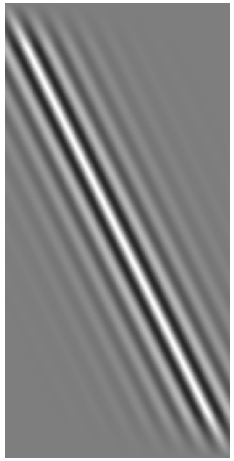


Response of ‘Energy mechanisms’ to a ‘fluted’ square wave

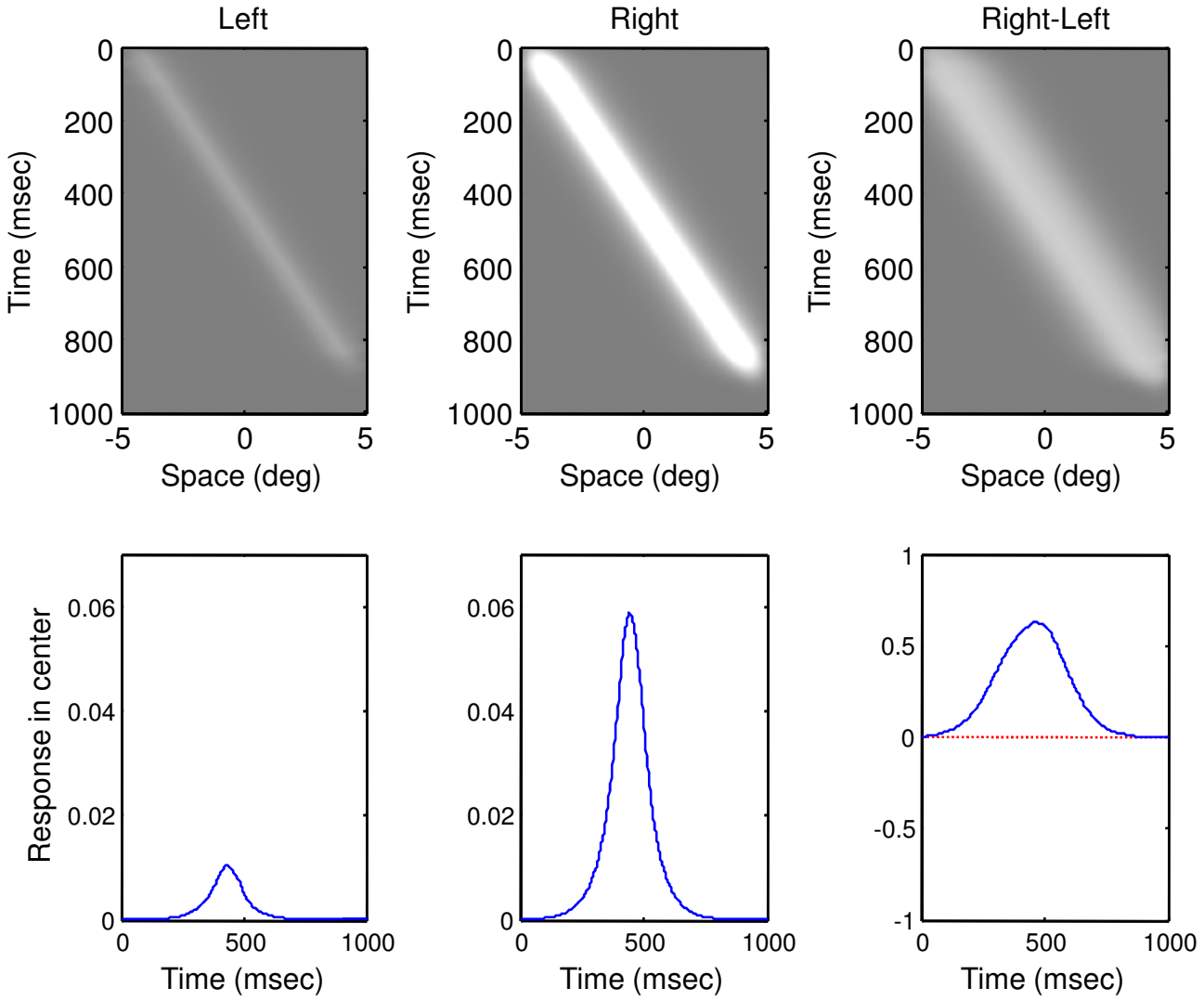


Response of ‘Energy mechanisms’ to a ‘fluted’ square wave

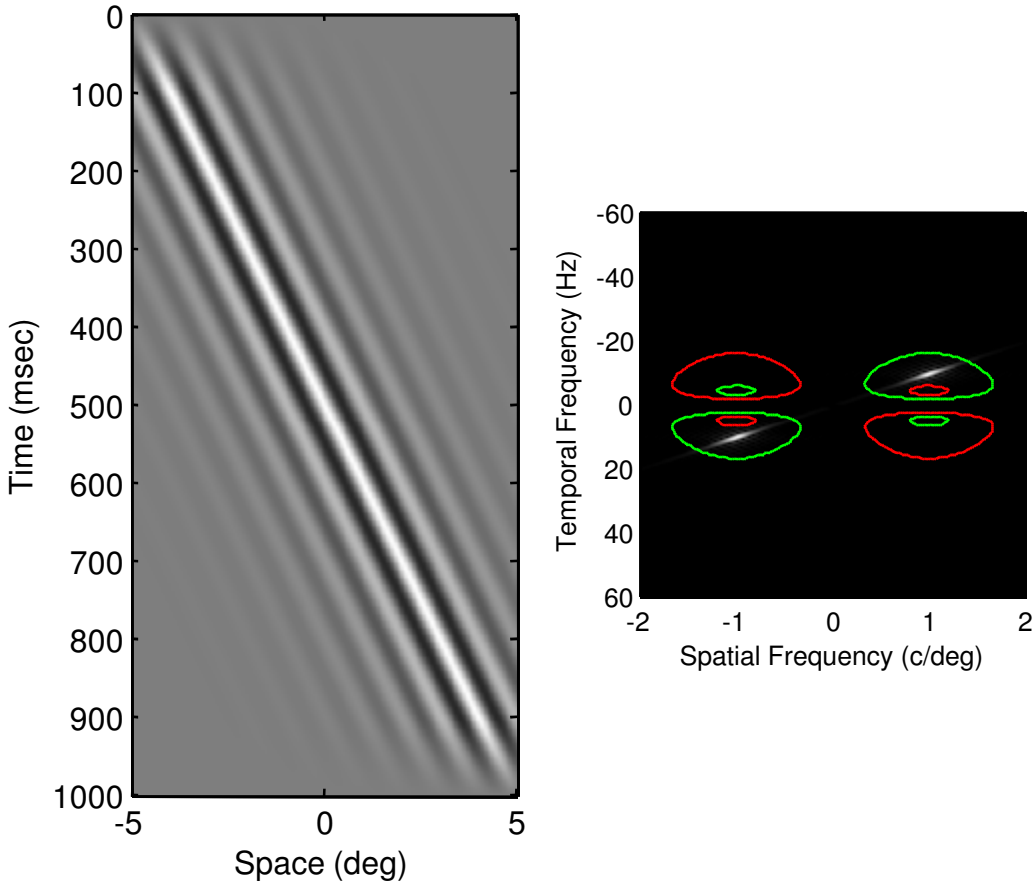


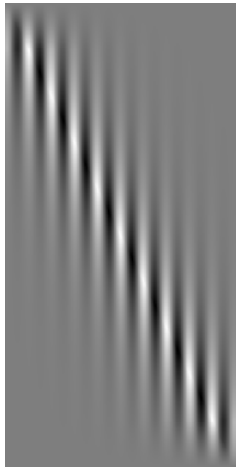


Response of ‘Energy mechanisms’ to rightward first order motion



Response of ‘Energy mechanisms’ to rightward first order motion





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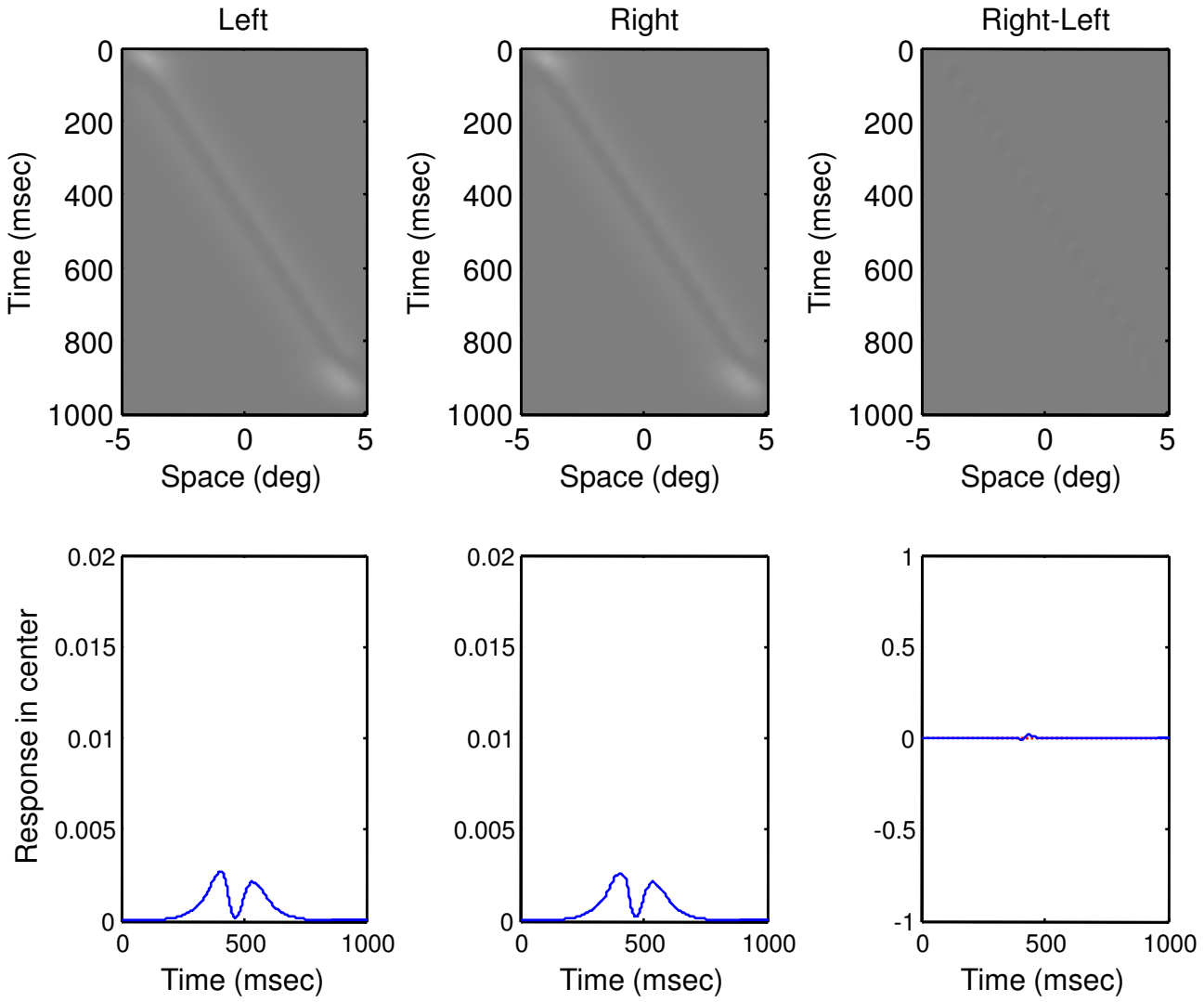

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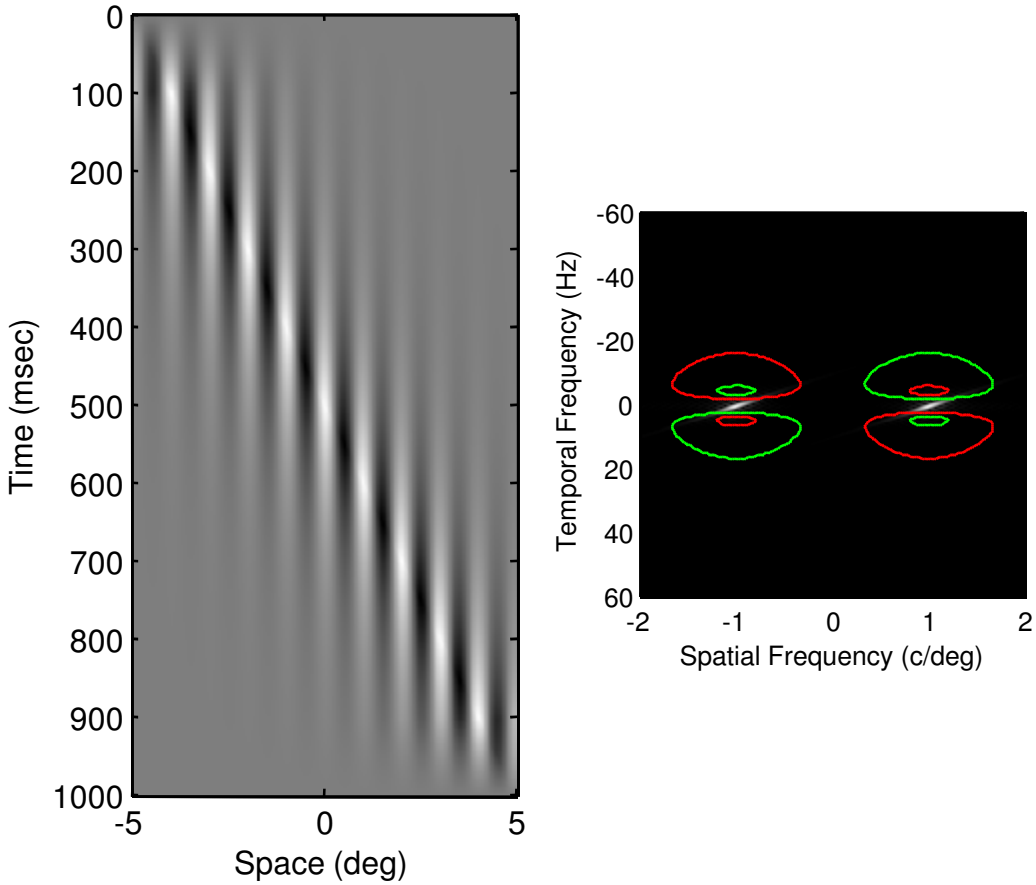
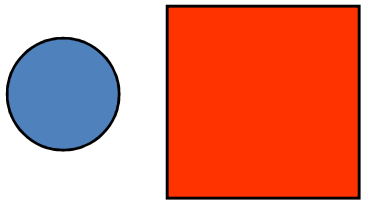
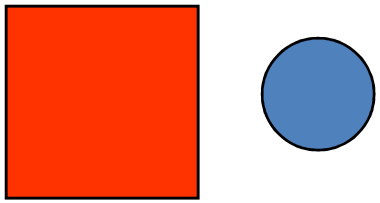




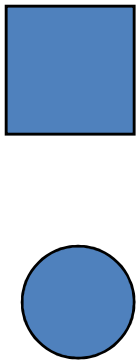
The box interrupts the apparent motion.



The box interrupts the apparent motion.

Rules of apparent motion:

Objects should not change shape when they move.



Rather than a box turning in to a circle (shortest path), we see the box disappearing and the circle moving diagonally.

Rules of apparent motion:

Objects should not change shape when they move.

Rather than a box turning in to a circle (shortest path), we see the box disappearing and the circle moving diagonally.