

Concept Question 7-5: How is it possible that the wavelet transform requires less computation than the FFT?

The wavelet transform consists of repeated convolutions with short-impulse-response filters, followed by downsampling. The total computation if the signal has duration N and the filters have durations L is less than $4(L + 1)N$ (see Section 7-5.5). The FFT requires $N \log(N)$ additions and $(N/2) \log(N)$ multiplications, which exceeds $4(L + 1)N$ for realistic values of L and N .