This paper describes how the continuous wavelet transform is used to filter multiple waveforms in both time and frequency domains. It is well suited to process the stationary signals, and it shows the signal in both time and frequency scales. This new approach was tested first on synthetic data and then on real data. The results obtained on both cases were good. The method consists of identifying the multiples on which we apply a normal move out using the multiple velocity law. The multiples will be aligned and the primary reflections will not be aligned. This operation allows locating the multiples in the time-scale domain. We compute the continuous wavelet transform (CWT for short) in order to focus on the patterns relative to seismic events. To filter the multiples, we define a zone with frequency and time bounds. These bounds are deduced from the projection of the seismic trace. Then an automatic mask is applied to the pattern to be isolated. Filtering in time–frequency domain is done by keeping only the wavelet coefficients that are outside the mask and assigning zero to the coefficients larger than a threshold amplitude inside the defined zone. The mask shape does not matter, which is not the case in classical filtering, where both the window size and shape play a key role. The mask is defined from three parameters: time, frequency, and the wavelet coefficients. To go back to the time domain, one has to compute the wavelet transform inverse of the trace. This procedure is repeated for all traces. To reset the traces to their initial positions, we apply the dynamic correction inverse with the same velocity law as the multiples. It turns out that the attenuation of multiples by the CWT works fine, in particular, the two identified multiples were quasi eliminated (Fig. 10)