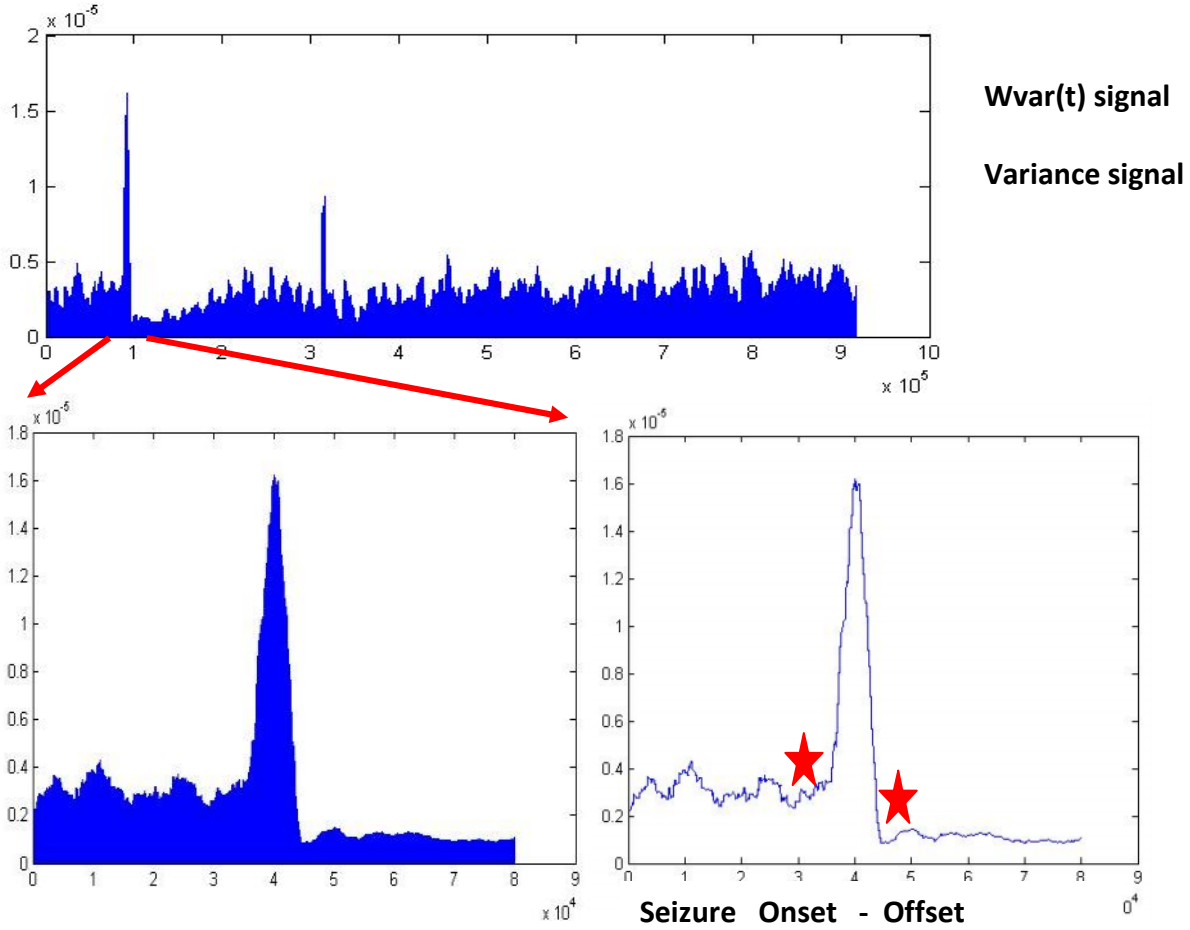
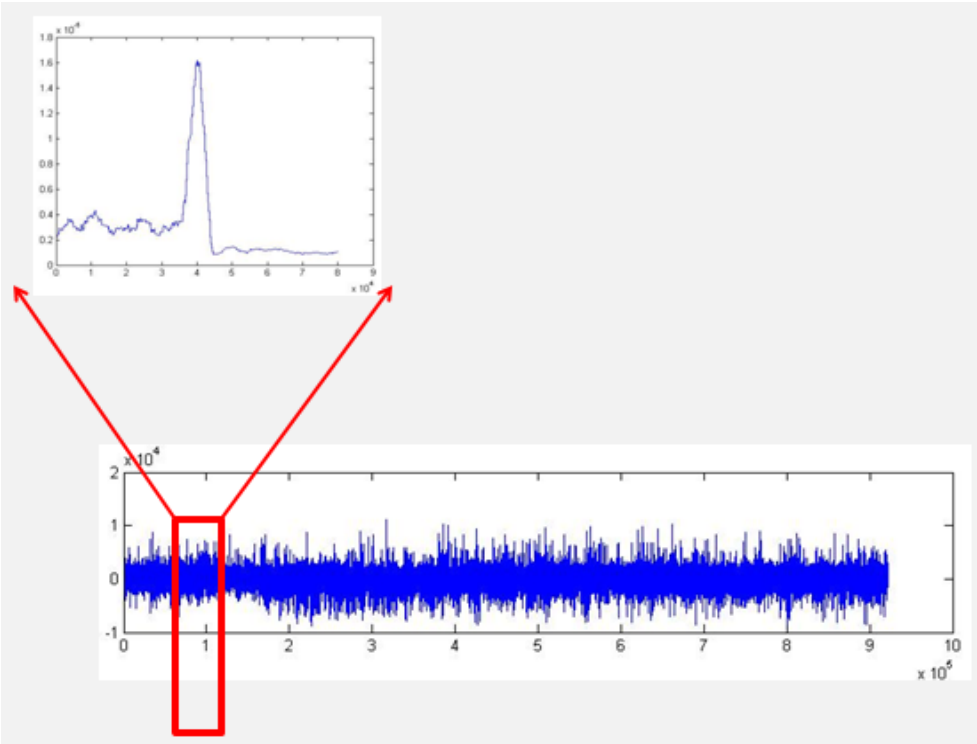
1. VARIANCE WINDOW SELECTION:

In this method we try to determine the accurate seizure onset and offset durations.

Initially raw ECoG signal is filtered through low-pass filter (50 Hz or 100 Hz).
Filtered signal is differentiated and windowed variance is taken.
Let this signal be " Wvar(t) " . In previous method, peak of this signal is noted as the seizure onset.

Here, by new method :
Peak of " Wvar(t) " is taken.
Window region of this selected peak is selected.
As shown in figure, it can be clearly seen "Wvar(t) " gradually increases from low amplitude to the its peak value and decreases.
These local minima points are taken as seizure onset and offset.
In some patients data this method is able to detect seizure much earlier than its actual occurrence.
This could be developed to seizure prediction of epilepsy.



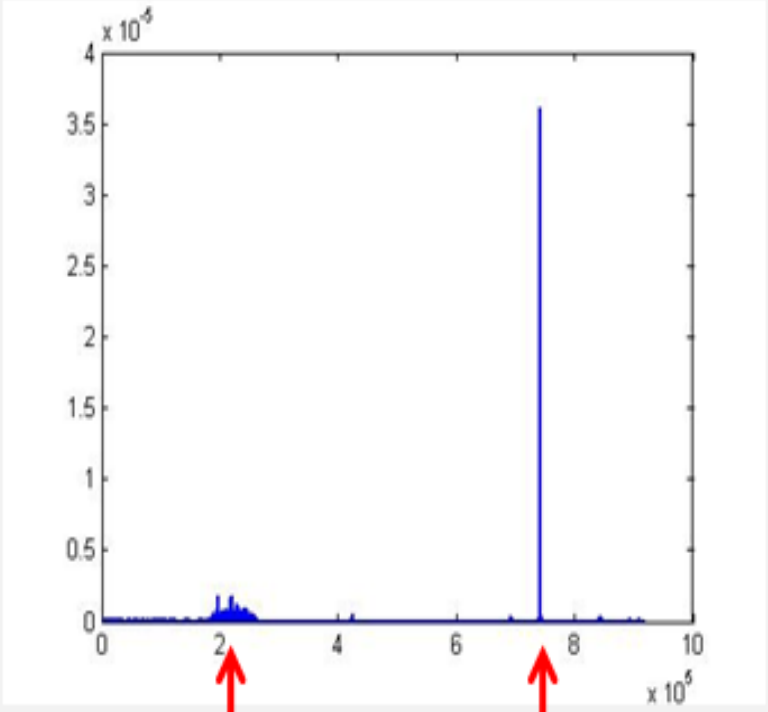


Selected Variance Window

Raw ECoG signal

2. PEAK REJECTION METHOD:

Here again " Wvar(t) " is taken. In some ECoG signals where artifacts and spike noise is present actual seizure region is overpowered by spikes.
That is " Wvar(t) " is having maximum peak in " unwanted spike regions " which is not seizure region. However on observations it is noticed that spike window maybe having higher amplitude but the next peak (seizure window) is having much wider amplitude presence (weight of the signal ; peak is much thicker).
On comparison peak is rejected if it is spike window having lower width than next peak (seizure peak window). So, by this method actual seizure window is detected.
Peak Rejection method is applied only to the patients where the signal is heavily corrupted with artifacts. This method is patient specific.



Windowed
Variance Plot

Peak 2 window is selected for SEIZURE window

Peak 2

Width of peak: > 3000

Peak 1

Width of peak: <700

REJECTED