

Optimal Filtering Supernovae Event Search : Current Status

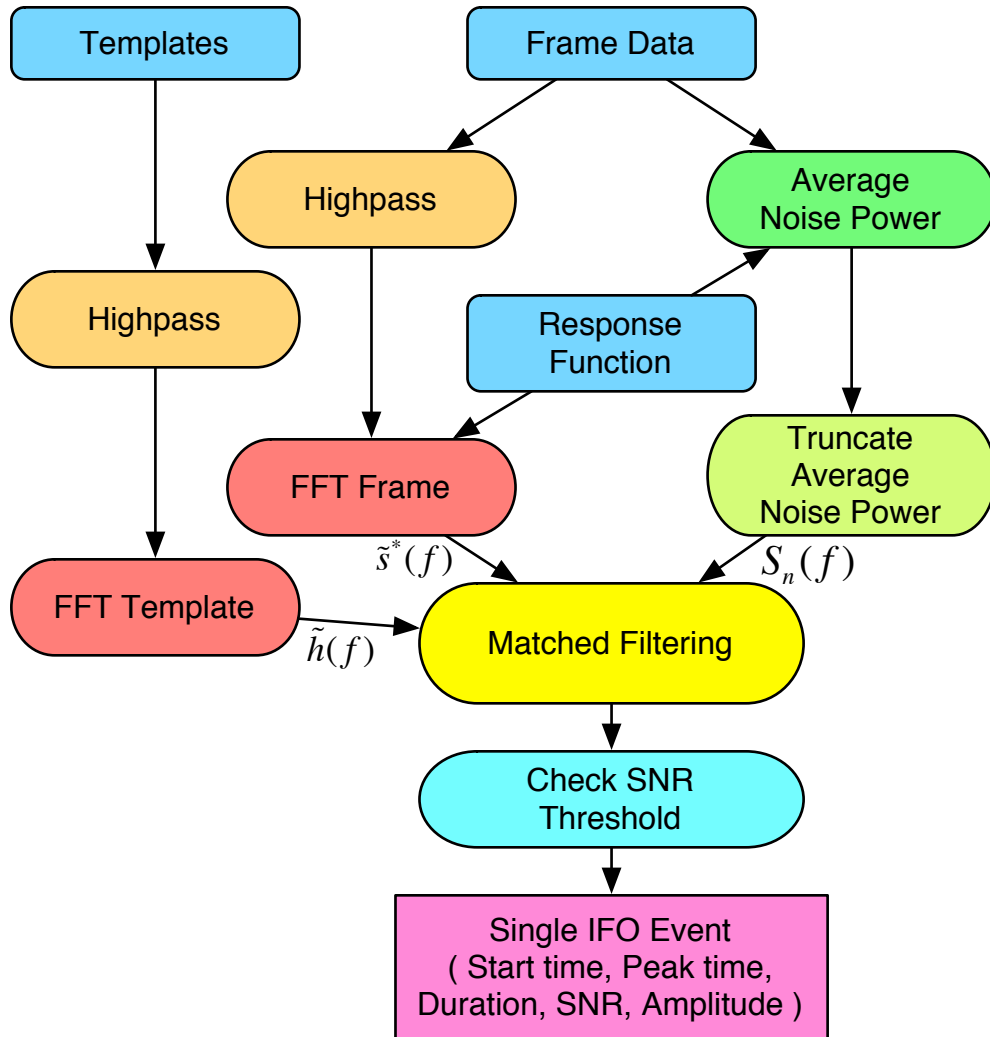
Search Code :

- LAL based code
(build based on Ringdown Search Code in the LAL/LALAPPS)
- Testing, bug fixing and tuning in progress
(Segment size, highpass frequency, SNR threshold)

Templates :

- Require adjustments on the simulated waveforms to use them as templates since none of the waveforms starts and ends with zero amplitude
- Smooth beginning using exponential decay, and ending utilizing Bézier curve

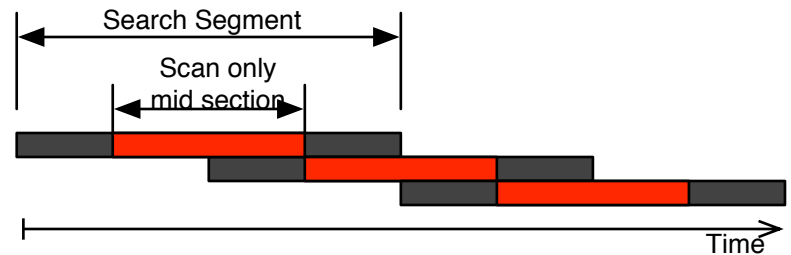
Search Code



$$z(t) = 4 \int_0^{\infty} \frac{\tilde{h}(f) \tilde{s}^*(f)}{S_n(f)} e^{2\pi i f t} df$$

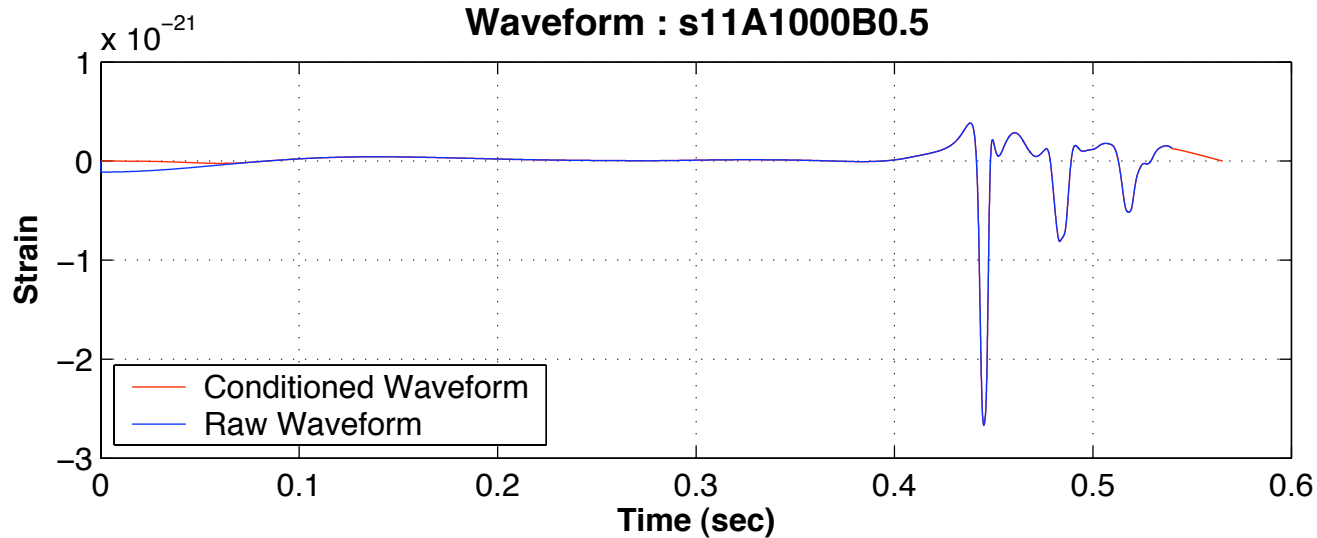
- Use hanning for average noise power
- No windowing for numerator part of the matched filter

Matched Filter Output



- Search segment overlapping 50%
- Scan events only on the **middle part** of a search segment since no windowing in the numerator)
- Ignore 1/4 of mached filter output at front and end of a segment

Template Conditioning : An Example



- Not all the waveforms starts and end with zero amplitude
- Require conditioning to minimize leakage
- Apply exponential decay at the beginning, and Bézier curve at the end of the waveform to smooth out

