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Answers to "A Tutorial on Onset Detection in Music Signals."

1) **What is the difference between attack and onset?**

   Onset is the designation of an earliest point in time when a transient can be detected. Attack on the other hand is the time in the transient in-between the onset and the highest point of amplitude before the decay starts.

2) **Why is pre-processing typically done to a signal?**

   Pre-processing is done to improve the performance of the algorithms that will test the audio. This technique will accentuate or attenuate elements in the audio that can help or hurt the analysis depending on what is being studied. Two forms popularly used and explained in this paper are using filter bands, used to 'cut up' and analyze the spectrum in an optimum way, and transient/steady-state separation which uses (I gather from the abstract nature of the papers explanation) in one example a sum of sinusoids compared to the original signal can find onsets based on a mismatch of the two signals.

3) **What is the purpose of reduction?**

   Reduction is the process of turning the audio signal into a detection function which creates. Two categories of processes are used: probabilistic (model-based change point detection method: difference between 2 models, surprise signals: assumption of signal) and predefined signal features (temporal features: envelope follower, spectral features: high frequency weighting or phase, and TRF time scale and time frequency representations).

4) **What is the role of peak picking?**

   Peak-Picking is an algorithm that is used to estimate the onset times of events within the signal. It finds the apex areas of a signal above a defined threshold. This threshold can be constant of adaptive.