

Q. What are epochs in speech production? Why are they significant in signal processing? Illustrate with an example.

Epochs refer to an instant of significant excitation of the vocal-tract during glottal closure.

They are significant because they hold information related to glottal closure and can be used to model speech systems and identify voiced regions of the speech signal and separate them from other strong impulses which are merely strong burst releases(noise).

Epochs is used by humans to perceive sounds at larger distances by hearing the epochs and neighbouring regions of excitation around voiced speech regions. The following feature is used in speech analysis for many applications. Such as knowing the epoch location in signal can be used for determining the fundamental frequency. It can also be used in prosody modification by using epoch as pitch markers to modify the pitch characteristics (contour, etc) from with the residuals derived from Linear Prediction and then using a modified LP residual signal from the modified epoch sequence and LP Coefficients for synthesizing speech, an important part of TTS.