

## Accepted Manuscript

Significance of Phase in Single Frequency Filtering Outputs of Speech Signals

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PII: S0167-6393(17)30174-7  
DOI: [10.1016/j.specom.2018.01.003](https://doi.org/10.1016/j.specom.2018.01.003)  
Reference: SPECOM 2525



To appear in: *Speech Communication*

Received date: 15 May 2017  
Revised date: 29 December 2017  
Accepted date: 15 January 2018

Please cite this article as: Nivedita Chennupati, Sudarsana Reddy Kadiri, B. Yegnanarayana, Significance of Phase in Single Frequency Filtering Outputs of Speech Signals, *Speech Communication* (2018), doi: [10.1016/j.specom.2018.01.003](https://doi.org/10.1016/j.specom.2018.01.003)

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**Highlights**

- The signal can be reconstructed using the magnitude and phase of the single frequency filtering (SFF) outputs provided sufficient number of frequencies are considered within the maximum frequency. The reconstruction is evaluated by computing root mean square error (RMSE) and signal to reconstruction error (SRER) between the original and reconstructed signals.
- The significance of the phase of SFF output of speech signals is examined.
- The phase only reconstruction of SFF outputs has shown that intelligibility increases with increase in value of  $r$  (location of pole on negative real-axis which is used to design a single pole-filter).
- The relative importance of magnitude and phase for reconstruction of the signal is examined for different values of  $r$  by interchanging their magnitude and phase components. It is observed that the intelligibility of the reconstructed signal is high if the SFF phase obtained for higher value of  $r$  is used with the SFF magnitude for lower value of  $r$ .
- The relative importance of SFF magnitude and phase is also observed by interchanging the magnitude and phase components for two different utterances for the same value of  $r$ . The information in the reconstructed signal is dominated by the phase component used.

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