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Instantaneous Frequency Based Index to Characterize Respiratory Crackles

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Abstract

Background: Crackle is a lung sound widely employed by health staff to identify respiratory diseases. The two-cycle duration (2CD) is a quantitative index pointed out by the American Thoracic Society and the European Respiratory Society to classify respiratory crackles as fine or coarse. However, this index, measured in the time domain, is highly affected by noise and filters of recording systems. Such factors hamper the analysis of data reported by different research groups. This work proposes a new index based on the instantaneous frequency of crackles estimated by means of discrete-time pseudo Wigner-Ville distribution. **Method**: Comparisons between 2CD and the proposed index were carried out for simulated

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