Radio Meteor Observing: Employing Algorithm to Increase the Reliability of Meteor Counting

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Observing and analyzing meteors is essential for the research of the Earth orbit. However, few studies had analyzed the HROFFT(Ham-band Radio meteor Observation by Fast Fourier Transform) data gathered through FM wave. The objective of this research is to detect the meteor data collected from the radio antenna using the algorithm we developed. Our algorithm is innovative in that it can be easily modified to analyze the data, and has higher data reliability. We gathered the meteor data through 2.5 m Yagi antenna installed at Busan, Korea receiving the NHK FM radio signal (85.2 MHz) approximately 1,400 km away. By analyzing this data, we obtained the daily and hourly patterns of the meteor shower from May to November, 2015. In the first setting, HROFFT signal level was low, and the noise filtering was turned on. In the second setting, HROFFT signal level was high, and the noise filtering was turned off. The meteor data from the first setting was in accordance with the theoretical hourly distributions and the meteor showers. On contrary, the results from the second setting showed the theoretical background noises and the patterns. The advantage of the first setting is the higher certainty of meteor detection, whereas the advantage of second setting is the higher accuracy on the number of meteors. Depending on the purpose of meteor research, the HROFFT signal level and noise filtering should be adjusted. By this research, we hope to guide future radio observers using the vast data acquired through algorithm we developed.

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