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mb Variations: The Implications of a Global IMS

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When complete, the International Monitoring System (IMS) will include 170 seismometer stations. These stations consist of various seismometer types, and are located in a range of geological and tectonic settings. The data recorded can be used to determine the body-wave magnitude (mb) of a seismic event, which is used in the mb:Ms event screening criterion applied at the International Data Centre (IDC). Event screening being the rejection of the null hypothesis that an event is a single point underground explosion. Initial development of the mb magnitude scale (and the mb:Ms criterion) was mainly based on body-wave data recorded by standard short-period instruments. Today, the IMS consists of a range of short-period and broadband instruments with a variety of responses.

Our work seeks to understand the implications of varying instrumentation and the potential impact on the mb values measured, as well as investigating the effect of variations in attenuation. Initial results suggest that a combination of these variables has the potential to affect the consistency of event mb magnitudes using the current IDC mb measurement method. We consider alternative methods which could prove more robust.

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Promotional text

This research aims to improve event screening by enhancing our understanding of variations in mb measurements and determining if current IDC mb measurement methods are optimal.

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