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Scoring IDC SEL1 events for identifying miss-formed events

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The International Data Center (IDC) produces several automatic seismic event lists followed by a reviewed event list as part of the Comprehensive Nuclear-Test Ban Treaty (CTBT) verification regime. For the time period from 2005 to 2011, on average, approximately 160 events per day were included in the first IDC automatic Standard Event List (SEL1). For the same time period, "only" 86 events per day were included in the IDC Reviewed Event Bulletin (REB). There are several possible reasons for an event in SEL1 to be excluded from the REB; for example: miss-associating information from several stations that recorded different events to form one artificial event. Reducing the large number of SEL1 events which are ultimately excluded from the REB would improve the automatic process relying on the outcome SEL1 and would reduce the workload of the analysts at the IDC. This work presents a score that indicates the probability that an SEL1 event will "survive" the analysis process and be included in the REB. The method tries to imitate "good" analyst practice, namely based on the experience gained in analyzing information from a specific region with a seismic network to decide if the event in question is a "real" event or not. The score was created for the International Monitoring System (IMS) primary seismic stations based on REB for the time period of 2005 to the beginning of 2011. The score is designed to indicate if the set of stations contributing/not contributing to the event is consistent with what is expected based on the analysis of past events that occurred in the same region. A by product of the score is a statistical measure which assesses the typical contribution of a specific station to a specific region. The measure can be useful to design subnetworks that increase automatic process efficiency.