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the 'False Events' Myth Thwarts Improvement of CTBTO Automatic Seismic Data Processing

The traditional approach to building an automatic global seismic event list requires that signals detected at different stations, and which belong to the same event, be 'associated'; this is an essential prelude to event location. Invalid signal detections and erroneous associations degrade the validity of many events, perhaps creating massive location errors or fictitious events built from signals rightly belonging to different events. CTBTO analysts 'discard' such events during review, and their associated signals are returned to the reservoir of unused signals unless used by analysts to contribute to a 'manually added' event. Analysts also discard many real events because they do not meet minimum criteria. An attempt is then made to find 'missed' events by applying a different association algorithm to the signals in the unused reservoir. Because this would result in the rebuilding of real events already discarded, the second association algorithm is applied only to signals not associated during automatic processing. Logical flaws in this procedure are explored, and proposals are made to correct them.

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