Assessment of earthquake parameters: Limited IDP knowledge could bring to magnitude overestimation.

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Historical events area known only thanks to macroseismic data. These data are then converted into Intensity at the scale of cities (called IDP, intensity data point). Unfortunately, the IDP coverage is variable; we can have a lack of information in some regions and the lowest Intensities can be unknown. Does it influence the source parameters assessment? To answer this question, we used modern macroseismic datasets on a well know earthquake and built several reduced datasets. For example, we simulated a new dataset of the same event where the intensity I and II are unknown, most of intensity III are not available, half of the intensity IV are not determined and 25% of Intensities V have been lost. We consider that most of the intensities VI to VII are known as they are strongly felt and start to produce damage on weak buildings. From each dataset, we deduced isoseismals areas based on an automatic processing using kriging interpolation with an adjustment of the kriging parameters (variogram, minimum number of IDP at a given distance to calculate new IDP). We observed that the isoseismal area increases when the dataset decreases. The reason is that by reducing the variability of the data we overestimate the "regional" intensity and then the associated isoseismal surface. A possible check is that it induces an "apparent lower attenuation" inconsistent with the usually observed in the region for modern events. If this is not taken into account, it could induce an overestimation of the magnitude.