



## **The effect of the velocity model, stations geometry, seismic phases and environmental noise level on earthquake location quality**

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The precision and accuracy in the estimation of focal parameters mainly depend by the seismic network features and by the velocity model used in the localization process. The number and geometry of the stations that detect a seismic event heavily affect the quality of the localization. To well constrain a hypocenter it is essential that a sufficient number of stations, near and around the epicenter, recording with good signal to noise ratio the event. Large azimuthal gap or the lack of stations near the epicenter can lead to a mistaken location. Low signal to noise ratio due to high-level environmental noise, can lead to large errors in the seismic phases picking thus compromising the precision of the hypocentral location. A not optimized velocity model may lead to strongly biased location affected by important systematic errors. In this work, by means of numerical simulation, will be investigated the effects of these parameters on the quality of the hypocenter estimation. With this goal were simulated different stations geometries, characterized also by different levels of environmental noise, and earthquakes location was carry out by introducing random and systematic errors in both velocity model and seismic phases arrival times. The results of simulations were summarized in focal parameters errors maps.