

The estimation of uncertainty of focal mechanism solution using initial motion polarity of P wave

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For judging reliability of the focal mechanism solution using initial motion polarity of P wave, Nakamura (2002) evaluated the difference between the determined solution and acceptable solutions. He defined Q to be weighted sum of inconsistencies between observed and calculated polarities, and the solution satisfied $Q_{min} \leq Q \leq Q_{min}+1.5$ as the acceptable mechanism. He computed the maximum angle between the axes, for example P axis, of best and all the acceptable solutions, regarded the angle as the reliability of the axis.

In this study, we present the way of the evaluation of the uncertainty of the solution, calculating the minimum resemblance (Kuge and Kawakatsu, 1993) between all the acceptable solutions ($Q_{min} \leq Q \leq Q_{min}+1.5$). The resemblance means the correlation between the radiation patterns of two mechanisms, and if two mechanisms resemble, the resemblance becomes big. The 90% of the minimum resemblances of JMA focal mechanism have the value of more than 0.6, and we conclude that the minimum resemblance between all the acceptable solutions is useful as the reliability of the focal mechanism.