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The high frequency strong ground motion from an earthquake is the result of a complex dynamic source rupture process and the propagation of seismic waves through a heterogeneous media. The near fault ground motion has been found to have a large influence on the radiation pattern characteristics from a heterogenous source model. Despite the high frequency radiation could be considered independent of the source-station azimuth or take-off angle of the seismic rays (spherical radiation), several researchers have found that for the intermediate frequency range (less than 3Hz) the radiation pattern still show some dependence on the azimuth (Liu and Helmberger 1895, Akazawa 2000). For the purpose of simulating the high frequency near field ground motion, Pitarka (2000) proposed a radiation pattern factor that is intended to introduce a smooth change from a non-spherical to a spherical radiation as the frequency increase. For achieving that purpose Pitarka (2000) obtained average values of radiation pattern for a region around the departing rays from the source. The limits of the average region decrease from 60 degrees around the azimuth and 30 around the take-off angle for the high frequencies, to no averaging for low frequencies. I actually found that this procedure still produce a radiation pattern factor dependent on the azimuth and take-off angle at high frequencies.

In the present study I propose a radiation pattern coefficient that varies smoothly from a non-spherical to a complete spherical radiation as the frequency increase. The radiation pattern coefficient for a particular station-source azimuth and take-off angle is linearly modify to approach an average value for the upper focal sphere, as the frequency increase. The model is used to simulate the high frequency ground motion during the Tottori-ken Seibu earthquake. The high frequency ground motion characteristics around the fault are discussed.