The earthquake source is represented by the point force ***f***, which may be written in terms of a moment tensor ***M*** as (omitting the source time function)

 (1)

The point force ***f*** in 3D:

, (2)

Multiplying equations (2) by the time-independent test functions, we can obtain

, (3)

where ,  and  are the test functions, respectively.

Applying the identity of the Dirac delta function

, (4)

If we can find the dimensionless parameters  satisfying

, (5)

or,

, (6)

Applying the chain rule, (4) can be written

, (7)

where,

, (8)

Substituting (6) and (8) into (7), we can obtain

, (9a)

, (9b)

. (9c)

Therefore, the source force at each GLL node can be written:

, (10a)

, (10b)

, (10c)