

Typographical corrections to “The dynamic field of a growing plane elliptical shear crack”, by Paul G. Richards, *Int. J. Solids Structures*, 1973.

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June 5, 2019

The closed-form solution for the radiation and stresses around a growing elliptical shear crack given by Richards (1973) contain typographical errors that are not obvious at first sight. After careful examination and rederivation of key formulae, *three* corrections are required to properly implement the solution:

- p.850, immediately following equation (17), the inequality should read:

$$\tau \equiv c_d t / R \geq \tau_{ws} \equiv (w^2 + c_d^2 / c_s^2)^{1/2}. \quad (1)$$

(no factor i should appear in the definition of τ_{ws});

- p.860, the definition of $q_{\sigma\nu}$ should read:

$$q_{\sigma\nu} = [w\Delta + i(w^2\Sigma^2N^2 + D)^{1/2}] / D. \quad (2)$$

(D should appear as the denominator, not factor);

- p.860, the condition for taking upper or lower sign in expressions for a_4 , a_5 , a_6 , a_8 and a_9 should read:

$$(\sigma^2 - \nu^2) \sin 2\phi \leq 0. \quad (3)$$

(the upper/lower inequalities should be flipped.).

A Matlab implementation of the solution is given in the code accompanying this note, available at https://github.com/nbrantut/Elliptical_shear_crack.git. The implementation relies on Matlab’s function `quadgk` to numerically evaluate the integrals. The code was checked against Richards’ plots.

The present note and accompanying code should help spreading the use of Richards’ solution in community benchmarks and for any other practical use.

References

Richards, P. G. (1973). The dynamic field of a growing plane elliptical shear crack. *Int. J. Solids Structures*, 9:843–861.

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