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The author's closure

I thank the discusser very much for proposing many comments. My response to the comments is as follows.

My publication is devoted to the numerical solution of the multiple curved crack problems. However, the discusser deals with questions concerning the singular integral equation and the quadrature rule on a real axis. Clearly, those are not key points in my paper.

For the singular integral equation of the curve crack problem, I have clearly indicated a reference written by Savruk (1981). I was afraid that people cannot obtain a Russian book; therefore, my publication was also attached. I am not a historian in the field of fracture analysis. In addition, many Russian references were not easy to obtain. In this case, only if the equations previously obtained by other researcher were cited, I think nothing could be criticized.

It is important to introduce the various numerical methods used in the curve crack problem. The first one is the projection method (Savruk, 1981). (Fig. 1(a)). In this method, a substitution $dt = (dt/dx)dx$ ($t = x + iy$, a complex variable) is used. Clearly, this method cannot be used to the more complicated case, as indicated in Fig. 1(b). The second method is the curve length method (Y.Z. Chen, Int. J. Solids Struc. 41 (2004) 3505–3519). In the method, a substitution $dt = (dt/ds)ds$ is used, where $ds = [(dx)^2 + (dy)^2]^{1/2}$. Since this method can solve the curve crack problem without geometry limitation, and it has not been introduced previously, I called it the new method. It is very strange for me that two methods were confused. Please note that the curve length method was never addressed in (Savruk, 1981). Also, if $\alpha > 90°$ in Fig. 3(d) of my paper, the projection method cannot be used. The singular integral equation with the use of boundary element is the third method (Fig. 1(c)). Frankly speaking, the present author does not like this method, simply because (a) some researcher showed that the method needs a lengthy derivation, (b) the COD function should be designed for the intermediate element and crack tip element separately. Please do not say this method good or bad. Let us make a competition, and solve the same problem by different methods, and then it is not too late to make the final conclusion.

A publication (Linkov, 2002) appeared more recently. It was introduced by the discusser as if the numerical solution for a singular integral equation along a curve had been solved very well. Let us read some chapters of the book, i.e. Chapter 12: complex variable boundary element method (CV-BEM) and Chapter 13: numerical experiments using CV-BEM. Data of the chapters are: (a) pages: 46 (from p. 200 to 245), (b) figures: 18, (c) equations: about 100 (including those with no numbering). Meantime, for the curve crack problems, one will find only one output devoted to a circular arc crack (not a curve crack in arbitrary configuration). Secondly, the output is for the crack opening dispacement of the circular arc crack at discrete

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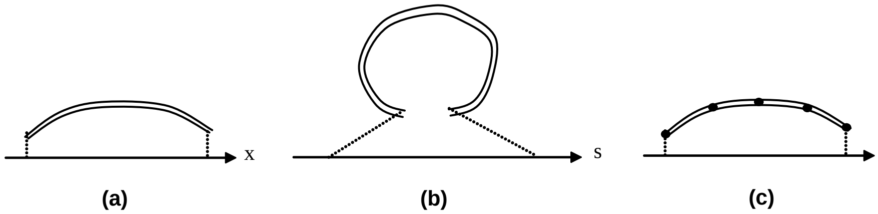

Fig. 1. (a) the projection method, (b) the curve length method, (c) the boundary element method.

points (p. 228), rather than the stress intensity factors at tips. I think it is not reasonable to ask researchers to use a rather complicated derivation. Also, I wonder why a good doctor sees a few patients.

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