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# Rapid evaluation of fatigue limit on thermographic data analysis

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## Abstract

Based on infrared thermography, the graphic methods such as Luong's method and Risitano's method are proved to be rapid and efficient for fatigue limit determination comparing to conventional methods. However, the determination procedure involves visual inspection so contains man-made uncertainties, which restricts their usage. In the present paper, we propose three new treatment methods in terms of relation curve between experimental temperature response (or dissipated energy) and the applied stress amplitude so as to determine the fatigue limit with uniqueness. Those three methods were all evaluated by applying to the experimental data from literature and the error of results were discussed and analyzed. In addition, numerical experiments were carried out to investigate the influence of loading stepped length and random error on each new treatment method.

**Keywords:** *fatigue limit, infrared thermography, self-heating, data analysis*