

## Accepted Manuscript

Shakedown-ratcheting analysis of Bree's problem by anisotropic continuum damage mechanics coupled with nonlinear kinematic hardening model

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PII: S0020-7403(17)32879-5  
DOI: [10.1016/j.ijmecsci.2018.01.030](https://doi.org/10.1016/j.ijmecsci.2018.01.030)  
Reference: MS 4148



To appear in: *International Journal of Mechanical Sciences*

Received date: 12 October 2017  
Revised date: 10 December 2017  
Accepted date: 25 January 2018

Please cite this article as: A. Surmiri , A. Nayebe , H. Rokhgireh , Shakedown-ratcheting analysis of Bree's problem by anisotropic continuum damage mechanics coupled with nonlinear kinematic hardening model, *International Journal of Mechanical Sciences* (2018), doi: [10.1016/j.ijmecsci.2018.01.030](https://doi.org/10.1016/j.ijmecsci.2018.01.030)

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**Highlights**

- Anisotropic continuum damage coupled with nonlinear kinematic hardening analysis of a spherical pressure under thermomechanical loading is investigated.
- The return mapping method is developed for anisotropic continuum damage model based on the fixed point method.
- The interaction diagram of Bree (ASME III NH code) for a defective pressure vessel is modified.
- Ratcheting – Shakedown regions are obtained based on the more accurate constitutive relations.
- Plastic shakedown region is diminished because of developed damage due to plastic flow and Elastic shakedown regions are insensitive with respect to the damage based plastic flow.

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