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**A return-mapping algorithm for plastic-damage models: 3-D and plane stress formulation.**  
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Summary: Three-dimensional and plane stress formulations of the return-mapping algorithm for a class of plastic-damage models are derived using the spectral decomposition form of the stress. We also develop a plane stress computation scheme based on spectral return-mapping algorithmic algorithm, and formulate the consistent algorithmic tangent stiffness for the present algorithm. The validation and performance of the algorithm are demonstrated by numerical examples.

**MSC:**

[74S30](#) Other numerical methods in solid mechanics (MSC2010)

[74R20](#) Anelastic fracture and damage

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**Keywords:**

[return-mapping algorithm](#); [plastic-damage models](#); [spectral decomposition](#); [plane stress computation scheme](#); [consistent algorithmic tangent stiffness](#)

**Software:**

[FEAP](#)

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