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A comparative study of the extended forming limit diagrams considering strain path, through-thickness normal and shear stress

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Highlights:

- The M-K model and Yld2011 advanced anisotropic yield criteria are employed for obtaining forming limits of AA2008-T4.
- Effect of bi-linear strain path, through-thickness normal and shear stresses are being investigated on different forms of forming limit presentation.
- Under non-proportional loading condition, diagrams in stress space (i.e., FLSD and XSFLD) are less sensitive to strain paths than PEPS-FLD.
- The effect of normal stress is more considerable than shear stress in increasing formability of sheet metal.
- Extended forming limit diagrams are not independent of out-of-plane stresses and the the variation depends on the variables of the coordinate plane.

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