UNIVERSITY COLLEGE LONDON

MENG MECHANICAL ENGINEERING

MECH0074 ENGINEERING IN EXTREME ENVIRONMENTS

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1.1.1 Principal stress

Principal stress is a measure which defines the maximum normal stress which may be applied to a body of interest and where that stress is located. Principal stress acts on the principal plane (an oblique plane at some angle θ) and has the condition that there is zero shear stress on this plane. The resultant normal stresses acting on the principal plane, σ_n, is the principal stress. The normal stress can take a maximum or minimum value.

In the 3D case, we find that there exist three principal planes (where the shear stress is zero), which are orthogonal and each have their own maximum / minimum normal stresses.

https://www.informit.com/articles/article.aspx?p=1729271&seqNum=4 https://mechcontent.com/principal-stress/#What_is_Principal_stress

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