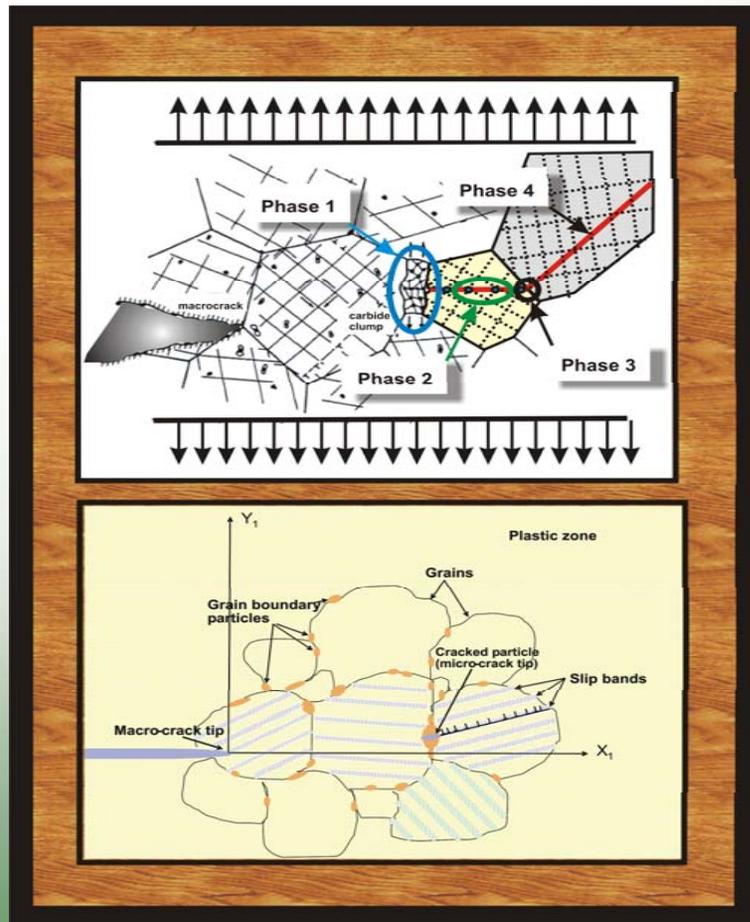


Development of Dislocation-Theory Based Fracture Mechanics (DISFRAC)

Modeling and Simulation Group

Computational Sciences & Engineering Division



Problem Statement:

- The U. S. Nuclear Regulatory Commission (NRC) requires leading-edge technical support to ensure the safety & reliability of pressurized components in U.S. nuclear power plants (NPP).

Technical Approach:

- Through its support of the Probabilistic Pressure Boundary Integrity Safety Assessment Program, CSED is engaged in advanced research into the fundamental mechanisms of cleavage fracture in ferritic steels by developing a new mechanistic theory of cleavage initiation and microcrack propagation/microarrest bridging a broad range of metallurgical microstructures. This theory is being implemented into the DISFRAC code.

Benefit:

- CSED research results will make a critical contribution to the understanding of cleavage fracture in ferritic steels used in the construction of NPP reactor pressure vessels.

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