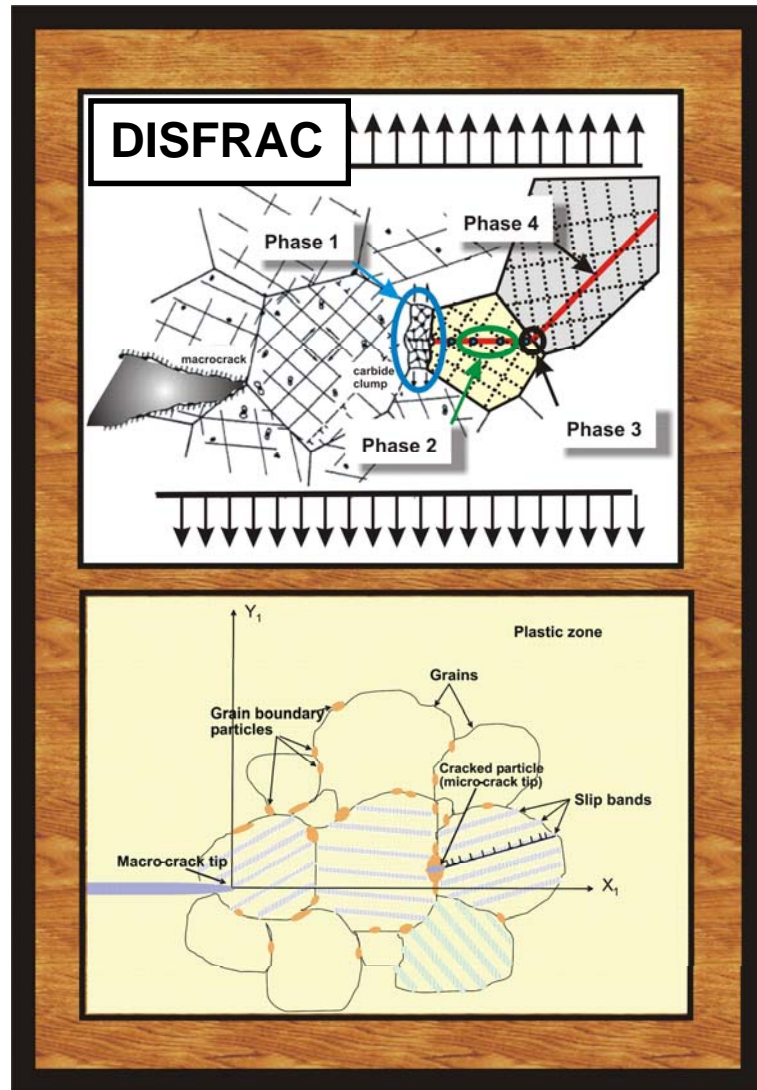


Development of Dislocation-Theory Based Fracture Mechanics (DISFRAC) Computer Program

Modeling & Simulation Group



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 Heavy-Section Steel Technology (HSST) 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 new 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.