

Flow Assurance Challenge: Calculation of Multiphase Flow Using Computational Fluid Dynamics

By

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The Erosion/Corrosion Research Center (E/CRC)**



Introduction

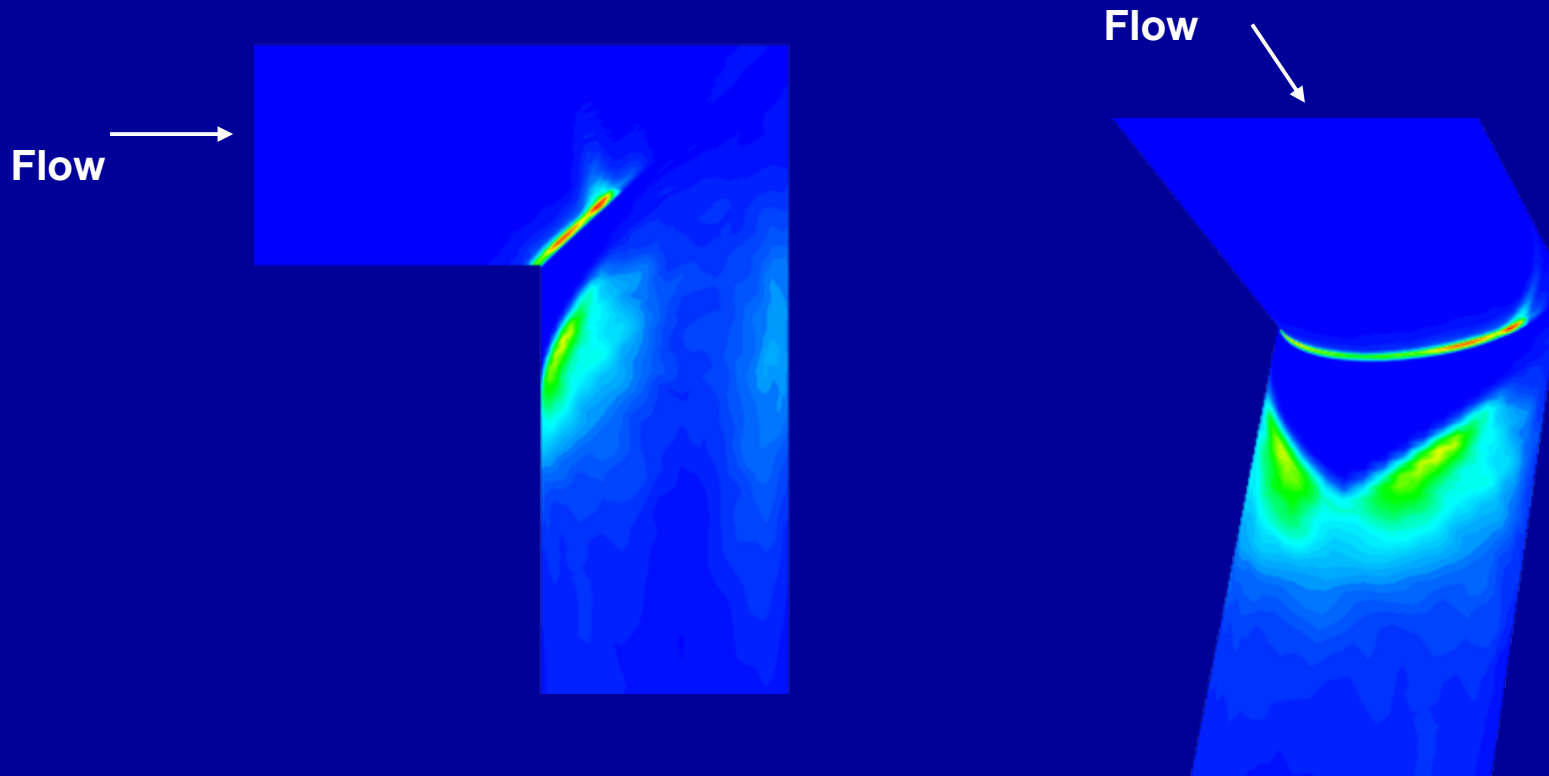
- **Within Tulsa University Sand Management Projects (TUSMP) and Erosion Corrosion Research Center (E/CRC) CFD has been used to determine erosion of components, pipes and fittings**
- **Computational Fluid Dynamics (CFD) also has been used to help determine efficiency of many types of equipment and processes such as**
 - **multiphase flow separators**
 - **multiphase submersible pumps**
 - **artificial lift equipment**
 - **multiphase flow meters**
 - **water knockout vessels**
 - **and many other types of equipment and vessels and pipes that are handling multiphase flow**

Area for Future Research/Development

- To further examine details of multiphase flow in equipment and pipes, CFD (sub) models are needed that can predict physics of multiphase flow:
 - Development of physics and models for 3D effects
 - Multiphase flow regimes
 - Interaction between various phases

CFD Can Help to Design Experiments and Equipment in Multiphase Flow

- CFD can help to realize and help model complex phenomena in a variety of multiphase flows



Predicted Erosion Patterns in a Sharp Bend

Sample Results

