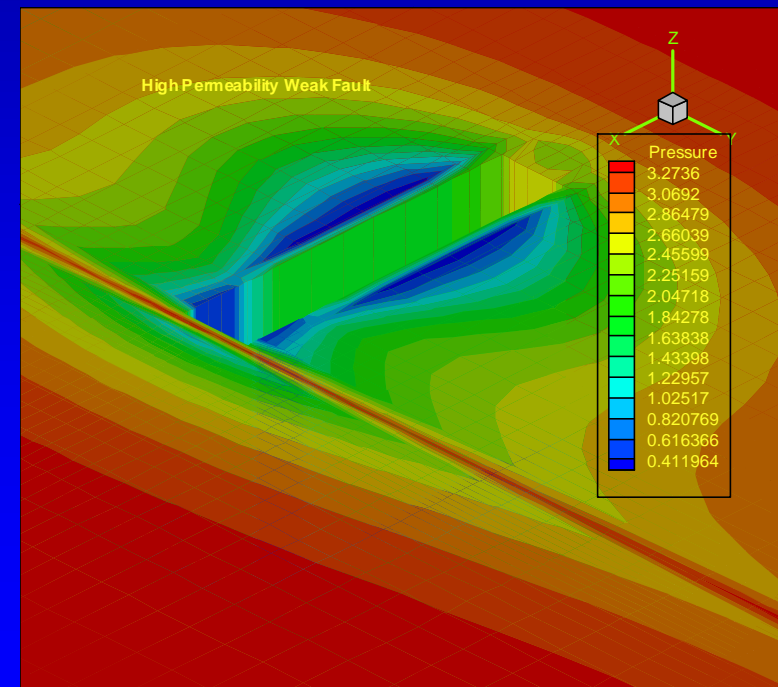
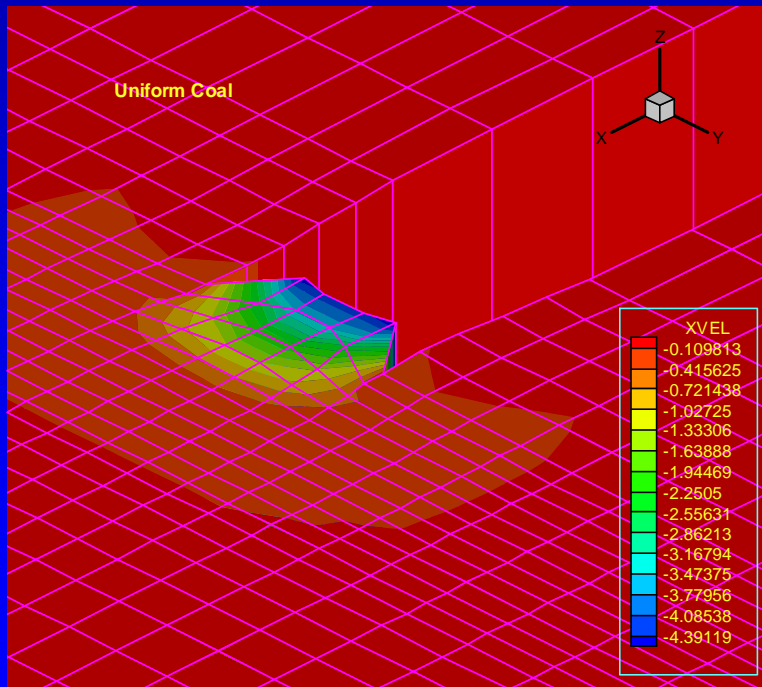
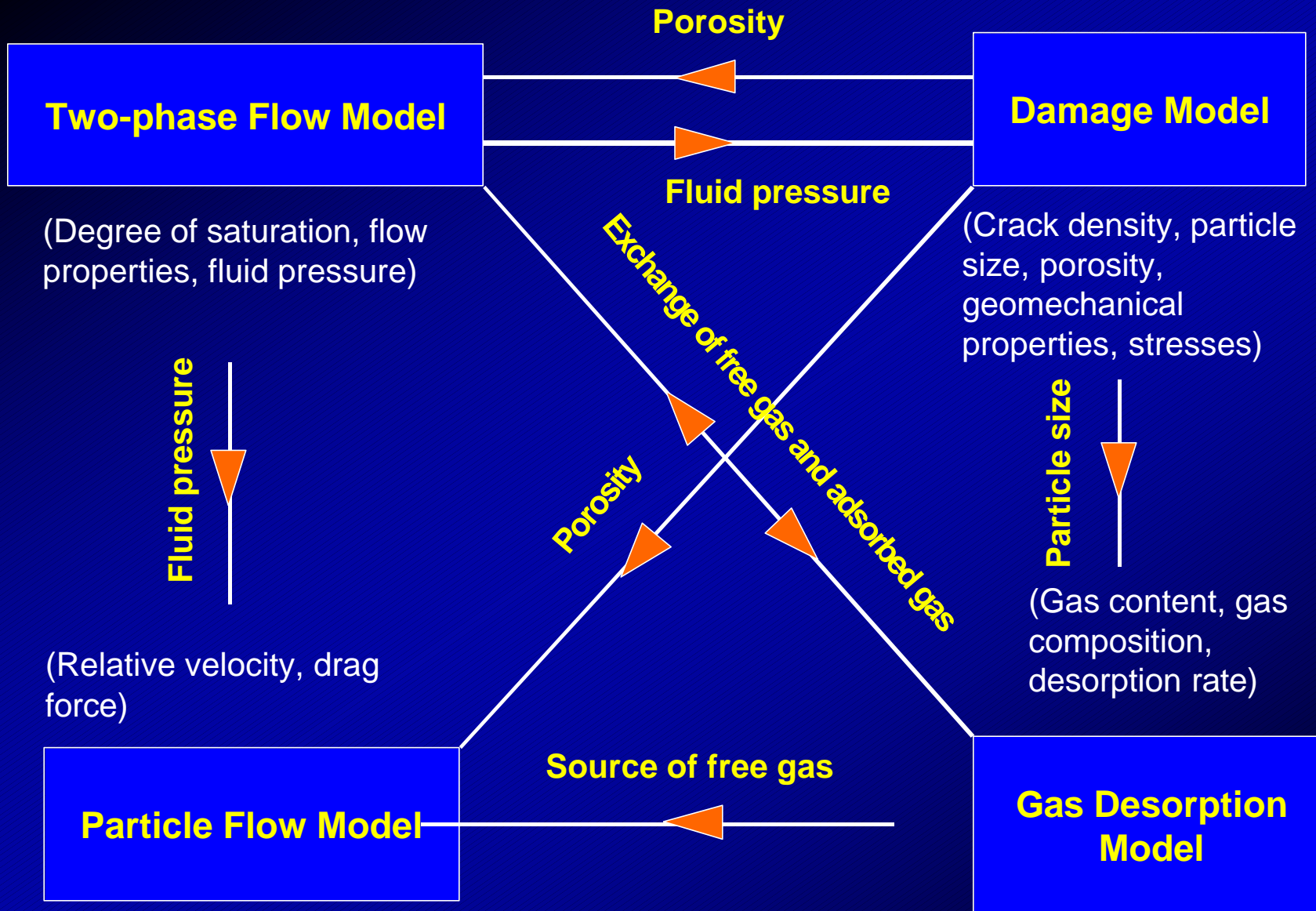


Simulation coupled geomechanical – reservoir model

Xavier Choi, CSIRO Petroleum



Coupled Geomechanical-Reservoir Model



Modelling of Transport of Gas Within Coal Matrix

- **Fickian Diffusion**
- **Pressure Driven**
 - **Particle size (cleat spacing)**
 - **Time of desorption (sorption kinetics)**
 - **Sorption properties (isotherm)**
 - **Pore structure**

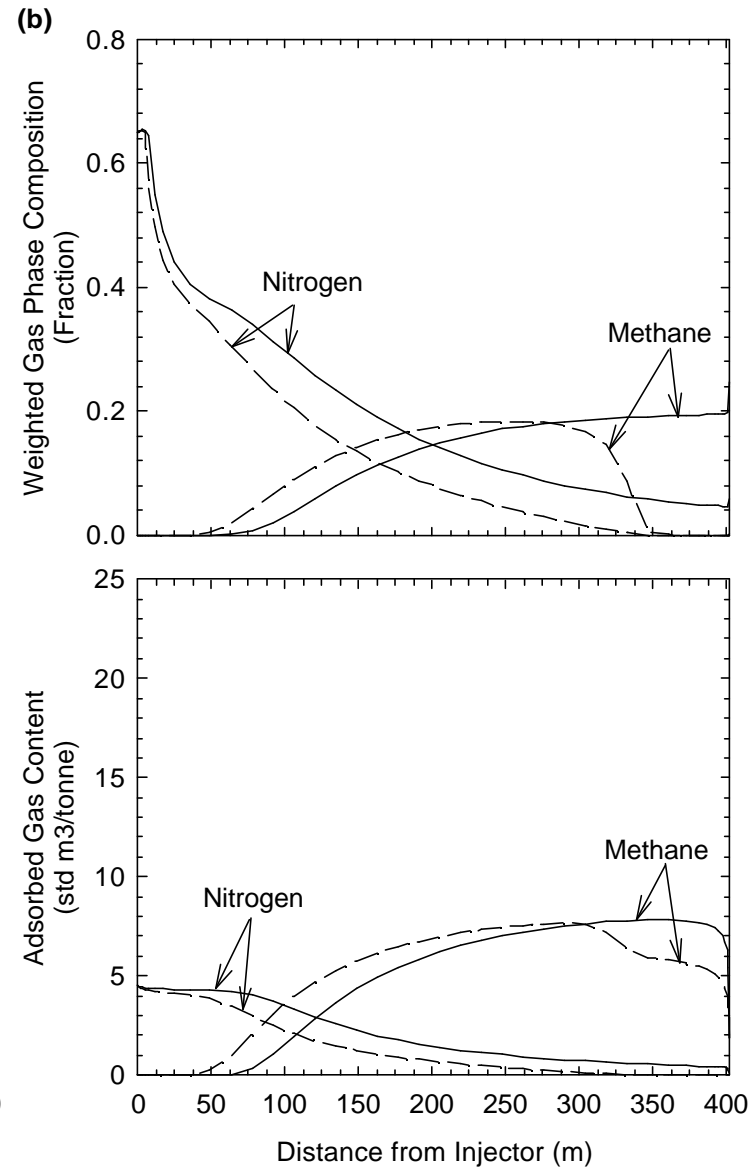
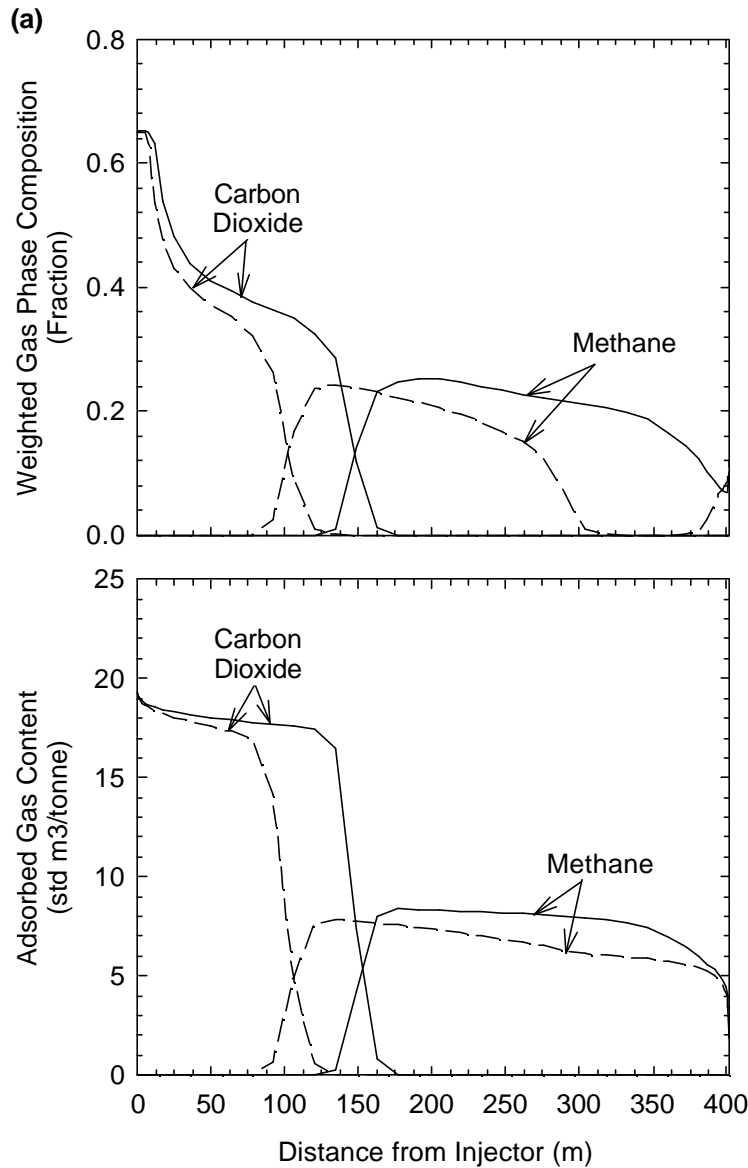


Application of Coupled Model to CO₂ Sequestration

- **Matrix swelling and shrinkage**
- **Deformation of coal and adjacent strata**
- **Stress-dependent permeability**
- **Inter-burden gas flow**
- **Flow localisation in new or pre-existing fractures and bedding, and re-activation of fault seals**
- **History matching and forward modeling**



Modeling of Pure CO₂ and N₂ Injection



CSIRO

Modeling of Mixed CO₂ and N₂ Injection

