1. INTRODUCTION

CT Scanning in the Earth Sciences

- Computer Axial Tomography (CAT or CT scanning) is an X-Ray based technique first developed in the late 1960s for medical 3D imaging purposes
- It has increasingly found applications in the earth sciences due to its ability to provide both quantitative and qualitative data regarding the internal structure of rocks and sediments

Aim of the study

The aim of this poster is to demonstrate:

- How 3D CT scans of core can provide more detailed recognition of structural features and sedimentary image facies from sub-surface reservoirs
- How bedding features that are common to both borehole image and core scan data can be used to provide a fully 3D CT scan to provide valuable structural and dip-azimuth information
- How structural data derived from core and CT images can be integrated with more traditional data collection techniques such as core logging

Deformation bands: character

- Compressional features form tightly spaced, planar and linear fractures
- Extensional features form widely spaced, dendritic and curvilinear fractures
- Influence on fluid flow - examples: function of permeability structure of individual bands, and its lateral variation, band thickness, frequency and orientation

Deformation bands: influence on fluid flow

- Orientation information is also valuable for placing the deformation bands within the wider structural context of the field, providing clues as to their origin and timing, and thus aiding their prediction

2. VALUE OF 3D CT SCANS

Core full 3D CT vs. circumferential '3D' CT

3D CT: new sedimentological insights

3D CT: induced vs. natural fractures

3D CT: new structural insights

3. 3D CT SCAN - BHI INTEGRATION

3D CT vs. borehole image data

Common borehole image data

3D CT Scan - BHI reorientation method

3D CT Scan - BHI integration workflow

4. RESULTS AND CONCLUSIONS

Classification in to deformation band sets

3D CT vs. BHI structural data

Integration with more traditional data sets

Conclusions

- 3D CT scans can greatly enhance sedimentological and structural understanding through direct visualisation of horizontal and vertical fractures within core and outcrop
- Detailed reorientation of 3D CT images will allow structural dips and azimuths to be determined accurately across core breaks and borehole data
- New generation CT scanners (eg. dual energy imaging) can provide useful additional insights into the nature of the rock fabric that can be derived from core