

## ERMI™

## Enhanced Resistivity Micro-Imager

ERMI provides micro resistivity borehole images in water-based mud well by high resolution array scanning. Special focusing circuitry ensures that the measuring currents are forced into the formation, where they are modulated in amplitude with the formation conductivities. The raw measurement currents are presented as high resolution images from which geological information is derived such as fractures, bedding, stratigraphy, dip information, depositional environments, etc.

The ERMI logging system includes ground equipments and downhole tools. Based on the hardware platform of ELIS Logging System, tool-controlling, data-processing and image-showing software is developed. ERMI can also operate using 5700 ground system and supporting sets.

### Specification:

#### DIMENSIONS AND RATINGS

- Max Temp: 350°F (175°C)
- Max OD: 5.0in. (127mm)
- Length: 27.8ft (8.46m)
- Weight: 589.41lbs (267.35kg)
- Max Press: 20,000 psi (137.9Mpa)
- Min Hole: 6 in. (15.24cm)
- Max Hole: 21in. (53.34cm)

#### BOREHOLE CONDITIONS

- Borehole Fluids: Salt  Fresh  Oil  Air
- Recommended Logging Speed (Image Mode): 20ft/min (6m/min)
- Recommended Logging Speed (Dip Mode): 20ft/min (6m/min)
- Tool Positioning: Centralized  Eccentralized

#### HARDWARE CHARACTERISTICS

- Source Type: Induced Current
- Sensor Type: Micro-Resistivity Buttons
- Sensor Spacing:
  - 2 rows containing 12 & 13 sensors, respectively 0.300 in. between rows
  - 0.200 in. between sensors on each row
  - 0.100 in. between sensors when both rows are superimposed
- Firing Rate: Continuous
- Sampling Rate: 120samples/ft (394samples/m)



**ERMI<sup>TM</sup>**

MEASUREMENT

	Resistivity	Azimuth	Rotation	Deviation	Caliper
Principle	Micro_Resistivity	Navigation			
Range	0.2-10,000 ohm-m 0<Rt/Rm<20,000	0-360°	0-360°	0-90°	6-21in.
Vertical Resolution	0.2in.	N/A	N/A	N/A	N/A
Depth of Investigation	Formation Dependent	N/A	N/A	N/A	N/A
Sensitivity	N/A	0.1°	0.1°	0.03°	0.1in.
Accuracy	N/A	± 5°	± 2°	± 4°	± 0.1in.
Primary Curves	Image	AZI1,HAZI	RB	DEVI	CAL1-6
Secondary Curves	Micro-Resistivity, Dip Angle, Dip AZI, Borehole Inclination				

APPLICATION

- Fracture identification and characterization
- Thin-bed analysis
- Characterization of sedimentary bodies
- Structural analysis
- Secondary porosity evaluation
- Orientation and substitution of cores
- Valuable help for reservoir characterization

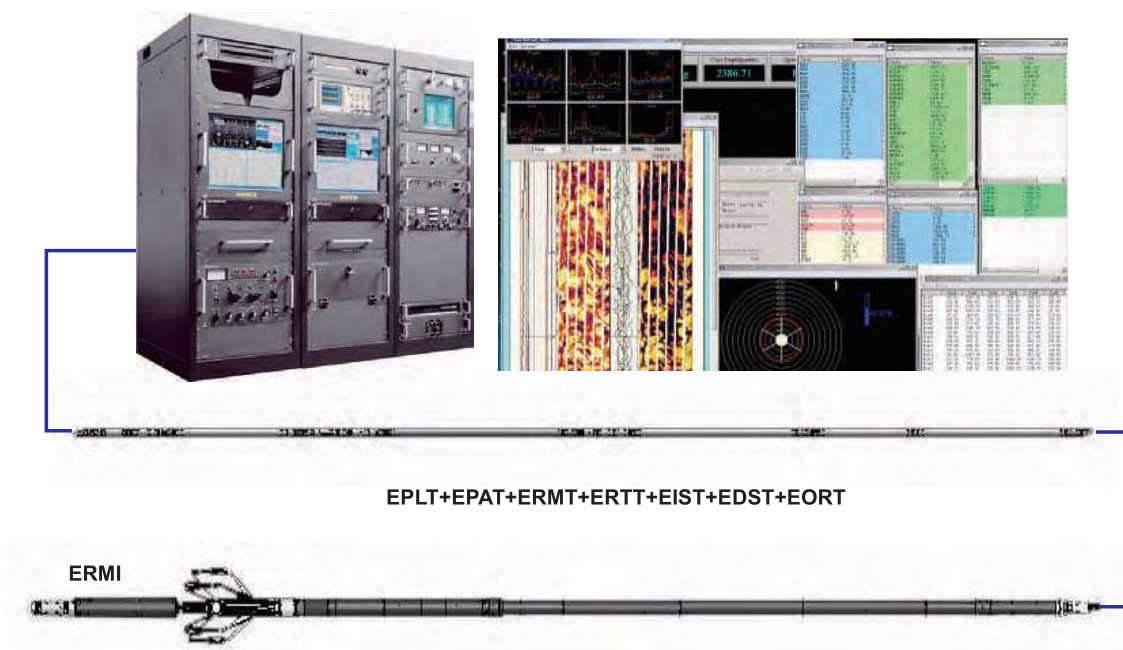
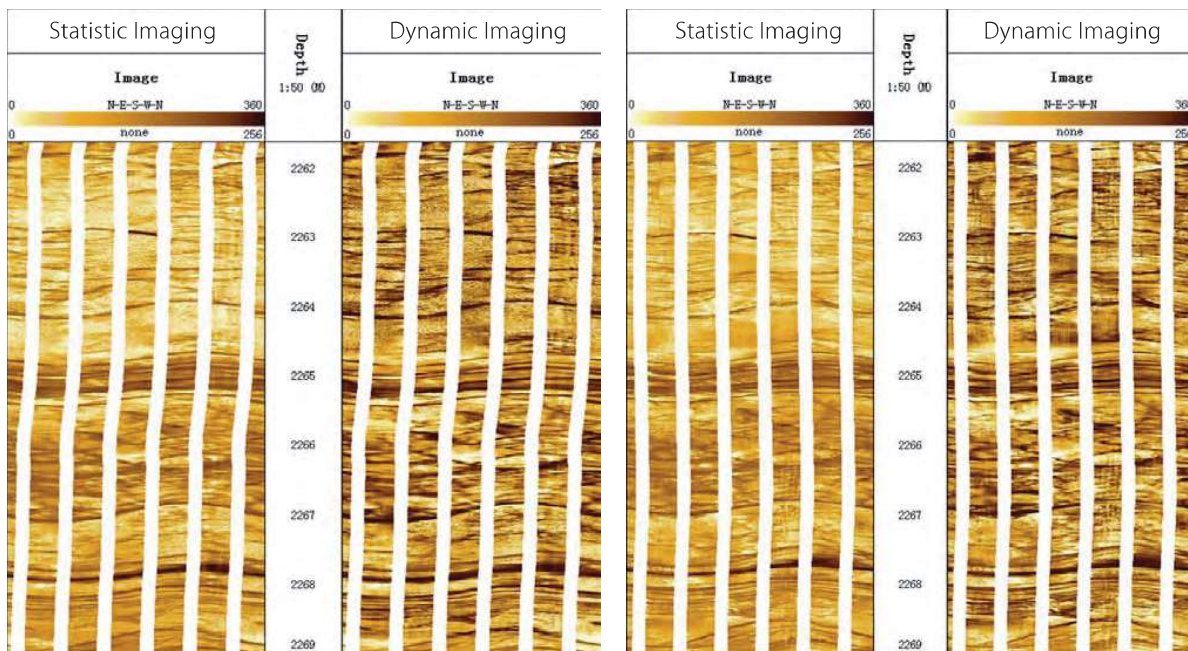


Figure 1 ERMILogging System



(ERMI)

(XRMI)

Figure 3 Images from ERMI and XRMI

ERMI tool has tested at a well, which image is shown in figure 3. Contrasted with XRMI image from the same well, the conclusion can be obtained, that formation features reflected by ERMI image is quietly equivalent to XRMI image.

ERMI™

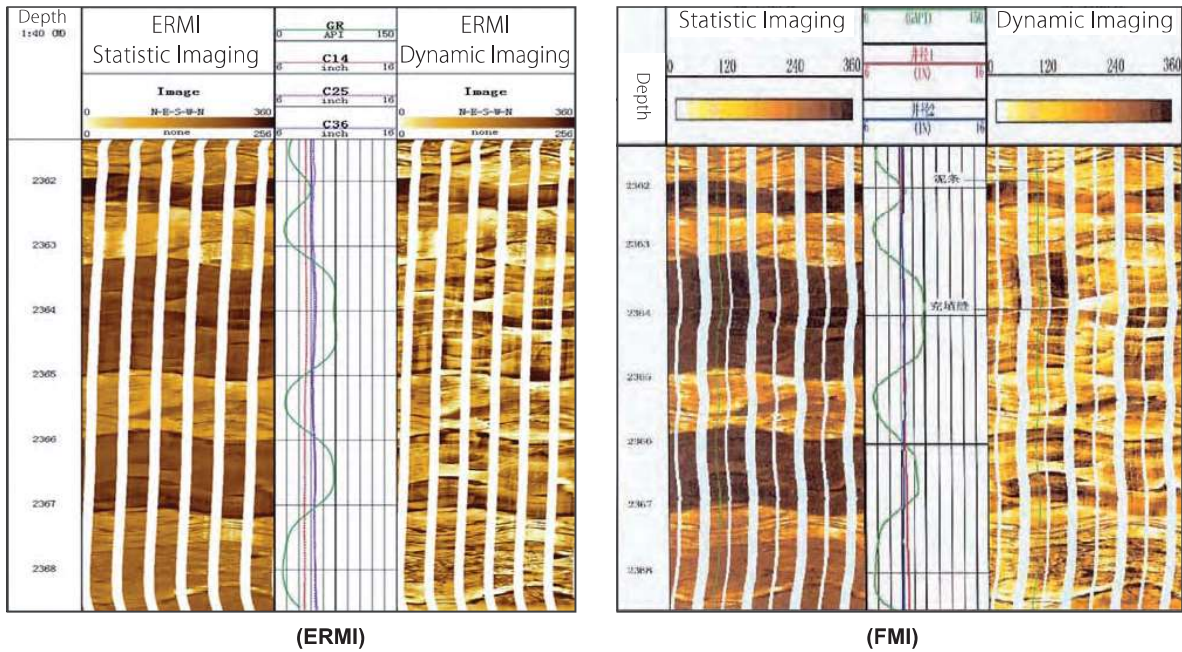


Figure 4 Images from ERMI and FMI

Figure 4 represents two images from ERMI and FMI tool for the same well, and it is obvious that two images have a good conformity.