Cross-validation for 3D interpolation of borehole data

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Sonic logs

Teapot Dome data courtesy of Rocky Mountain Oilfield Testing Center, US Department of Energy & Transform Software & Services
Sonic logs

Depth (km)

1 km

Velocity (km/s)

5.5

5

4.5

4

3.5

3

2.5
Sonic logs
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Sonic logs
Sonic logs
Sonic logs
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Sonic logs

Depth (km)

1 km
Acoustic impedance
Metric tensor field

Depth (km)

1

2

1 km
depth
1.5 km
depth
1 km
velocity log

interpolated

1 km

1.5 km

1 km
Velocity log
smoothed log
interpolated

1 km
rms error = 245 m/s

1.5 km
rms error = 291 m/s
velocity log
smoothed log
interpolated

rms error = 70 m/s
rms error = 136 m/s
Velocity (km/s)

Depth (km)

- **velocity log**
- **smoothed log**
- **interpolated**

1 km
- rms error = 114 m/s

1.5 km
- rms error = 196 m/s
Velocity (km/s)

Depth (km)

velocity log
smoothed log
interpolated

rms error = 125 m/s

rms error = 220 m/s