2006 Fynmeet Sea Clutter Measurement Trial
Dataset Overview for 31-Jul-2006

Dr PL Herselman
This document provides an overview for the datasets (or subset thereof) recorded on 31-Jul-2006 as part of the Fynmeet Sea Clutter Measurement Trial conducted at the Overberg Test Range at Arniston, South Africa. The trial was conducted over the period from 18 July to 4 August 2006. These datasets have been stored in structured Mathworks Matlab (*.mat) files and will be made available to research institutes or universities upon request. For more information contact Dr PL Herselman at pherselman@csir.co.za.

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Dataset CFA14-001

![RCS vs. time and range - CFA14-001](image)

<table>
<thead>
<tr>
<th>Experiment Summary</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Sea Clutter</td>
</tr>
<tr>
<td>Date</td>
<td>31-Jul-2006</td>
</tr>
<tr>
<td>Start Time</td>
<td>17:08:36.375</td>
</tr>
<tr>
<td>Duration</td>
<td>305830 PRI's (61.1658 s)</td>
</tr>
<tr>
<td>Original File</td>
<td>PF060731.014</td>
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<tr>
<td>Processor Version</td>
<td>FMSCP Ver 01.22</td>
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<th>Radar Setup</th>
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<tr>
<td>tx frequency</td>
</tr>
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<td>PRF</td>
</tr>
<tr>
<td>Tracking Range</td>
</tr>
<tr>
<td>Range Extend</td>
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<table>
<thead>
<tr>
<th>Environment</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Inst. Wind</td>
<td>13.1 kts, 139.5 deg. N</td>
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<tr>
<td>Wind Gust</td>
<td>18.7 kts, 143 deg. N</td>
</tr>
<tr>
<td>8hr Avg. Wind</td>
<td>19.5 kts, 159.9 deg. N</td>
</tr>
<tr>
<td>Wave (SWH)</td>
<td>3.12 m, 184.6 deg. N</td>
</tr>
<tr>
<td>Grazing Angle</td>
<td>1.02 - 1.66 deg.</td>
</tr>
<tr>
<td>Antenna Azm.</td>
<td>166.5 deg. N</td>
</tr>
<tr>
<td>Antenna Elv.</td>
<td>-1.261 deg.</td>
</tr>
<tr>
<td>Antenna BW.</td>
<td>2 deg. Az, 2 deg. El</td>
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<tr>
<td>GPS Data</td>
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<td>I/Q Imbalance</td>
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</tr>
<tr>
<td>Complex Conj.</td>
<td>Applied</td>
</tr>
<tr>
<td>Calibr. Coef.</td>
<td>187.7 dB</td>
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<tbody>
<tr>
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<tr>
<td>Grazing Angle</td>
<td>1.02 - 1.66 deg.</td>
</tr>
<tr>
<td>Antenna Azm.</td>
<td>166.5 deg. N</td>
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<tr>
<td>Antenna Elv.</td>
<td>-1.261 deg.</td>
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<tr>
<td>Antenna BW.</td>
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<td>Odd Gates Offset</td>
<td>2.3664+3.7373i</td>
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<td>Even Gates Offset</td>
<td>-3.0536-0.28047i</td>
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<td>Bypassed</td>
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<td>Complex Conj.</td>
<td>Applied</td>
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![Plan Overview of Dataset - CFA14-001](image)

![Doppler Shift vs. time - CFA14-00](image)
Dataset CFB14-001

Experiment Summary

<table>
<thead>
<tr>
<th>Type</th>
<th>Sea Clutter</th>
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<tr>
<td>Start Time</td>
<td>17:13:12.125</td>
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<td>Duration</td>
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<td>Original File</td>
<td>PF060731.017</td>
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Radar Setup

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<th>Value</th>
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</thead>
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<tr>
<td>Tx Frequency</td>
<td>8 GHz</td>
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<tr>
<td>PRF</td>
<td>5 kHz</td>
</tr>
<tr>
<td>Tracking Range</td>
<td>2300.94 m</td>
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<tr>
<td>Range Extend</td>
<td>1440 m (96 gates), 15 m res.</td>
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Original File

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<tr>
<th>Original File</th>
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Waveform Type

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Waveform Bandwidth

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Waveform File

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Environment

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<th>Value</th>
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<tbody>
<tr>
<td>Inst. Wind</td>
<td>12.8 kts, 137.7 deg. N</td>
</tr>
<tr>
<td>Wind Gust</td>
<td>18.7 kts, 143 deg. N</td>
</tr>
<tr>
<td>8hr Avg. Wind</td>
<td>19.5 kts, 159.9 deg. N</td>
</tr>
<tr>
<td>Wave (SWH)</td>
<td>3.12 m, 184.1 deg. N</td>
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<td>GPS Data</td>
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Geometry

<table>
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<tr>
<td>Grazing Angle</td>
<td>1.02 - 1.66 deg.</td>
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<tr>
<td>Antenna Azm.</td>
<td>166.5 deg. N</td>
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<tr>
<td>Antenna Elv.</td>
<td>-1.261 deg.</td>
</tr>
<tr>
<td>Antenna BW.</td>
<td>1.9 deg. Az, 1.9 deg. El</td>
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Processing

<table>
<thead>
<tr>
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<th>Value</th>
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<tr>
<td>Odd Gates Offset</td>
<td>2.1+3.7149i</td>
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<td>Bypassed</td>
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<tr>
<td>Complex Conj.</td>
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<tr>
<td>Calibr. Coeff.</td>
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Plan Overview of Dataset - CFB14-001

Doppler Shift [Hz]

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<tr>
<td>-400</td>
<td>-400</td>
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<td>-300</td>
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<td>-200</td>
<td>-200</td>
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Doppler Shift [Hz]

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<tr>
<td>50</td>
<td>50</td>
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<tr>
<td>60</td>
<td>60</td>
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RCS [dBm². Hz⁻¹] at range 2885.9375 m (gate 40) - CFB14-001

RCS [dBm². Hz⁻¹] at range 3185.9375 m (gate 60) - CFB14-001

RCS [dBm². Hz⁻¹] at range 3485.9375 m (gate 80) - CFB14-001
Dataset CFC14-001

Experiment Summary

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<thead>
<tr>
<th>Value</th>
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<td>Type</td>
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<tr>
<td>Date</td>
<td>31-Jul-2006</td>
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<tr>
<td>Start Time</td>
<td>13:57:35.843</td>
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<td>Duration</td>
<td>574920 PRI's (114.9838 s)</td>
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<tr>
<td>Tracking Range</td>
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<tr>
<td>Range Extend</td>
<td>1440 m (96 gates), 15 m res.</td>
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<td>Original File</td>
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<td>\20060731_ifs_g</td>
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<th>Geometry</th>
<th>Value</th>
<th>Processing</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind Gust</td>
<td>27.6 kts, 162 deg. N</td>
<td>Antenna Azm.</td>
<td>166.4 deg. N</td>
<td>Even Gates Offset</td>
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<tr>
<td>8hr Avg. Wind</td>
<td>14.2 kts, 170.9 deg. N</td>
<td>Antenna Elv.</td>
<td>-1.184 deg.</td>
<td>I/Q Imbalance</td>
<td>Bypassed</td>
</tr>
<tr>
<td>Wave (SWH)</td>
<td>3 m, 183.6 deg. N</td>
<td>Antenna BW.</td>
<td>1.8 deg. Az, 1.8 deg. El</td>
<td>Complex Conj.</td>
<td>Applied</td>
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<tr>
<td>GPS Data</td>
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Calibr. Coeff. 190.9 dB
RCS [dBm^2.Hz^-1] at range 1880.625 m (gate 60) - CFC14-001

RCS [dBm^2.Hz^-1] at range 2180.625 m (gate 80) - CFC14-001
## Dataset CFC14-002

### Experiment Summary

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<th>Parameter</th>
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<tbody>
<tr>
<td>Type</td>
<td>Sea Clutter</td>
</tr>
<tr>
<td>Date</td>
<td>31-Jul-2006</td>
</tr>
<tr>
<td>Start Time</td>
<td>14:01:26.515</td>
</tr>
<tr>
<td>Duration</td>
<td>323530 PRI's (64.7058 s)</td>
</tr>
<tr>
<td>Original File</td>
<td>PF060731.004</td>
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<tr>
<td>Original Path</td>
<td>\20060731_ifs_g</td>
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<tr>
<td>Processor Version</td>
<td>FMSCP Ver 01.22</td>
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### Radar Setup

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<th>Parameter</th>
<th>Value</th>
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</thead>
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<tr>
<td>Tx Frequency</td>
<td>9 GHz</td>
</tr>
<tr>
<td>PRF</td>
<td>5 kHz</td>
</tr>
<tr>
<td>Tracking Range</td>
<td>2300 m</td>
</tr>
<tr>
<td>Range Extend</td>
<td>1440 m (96 gates), 15 m res.</td>
</tr>
<tr>
<td>Waveform Type</td>
<td>Fixed Frequency</td>
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<tr>
<td>Waveform Bandwidth</td>
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### Environment

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<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inst. Wind</td>
<td>18.3 kts, 151.8 deg. N</td>
</tr>
<tr>
<td>Wind Gust</td>
<td>27.8 kts, 159 deg. N</td>
</tr>
<tr>
<td>8hr Avg. Wind</td>
<td>14.3 kts, 170.5 deg. N</td>
</tr>
<tr>
<td>Wave (SWH)</td>
<td>3 m, 183.3 deg. N</td>
</tr>
<tr>
<td>Grazing Angle</td>
<td>1.02 - 1.66 deg.</td>
</tr>
<tr>
<td>Antenna Azm.</td>
<td>166.4 deg. N</td>
</tr>
<tr>
<td>Antenna Elv.</td>
<td>-1.187 deg.</td>
</tr>
<tr>
<td>Antenna BW.</td>
<td>1.8 deg. Az, 1.8 deg. El</td>
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<tr>
<td>GPS Data</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Calibr. Coeff.</td>
<td>190.9 dB</td>
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### Processing

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<th>Value</th>
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</thead>
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<tr>
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<td>1.2517-0.58421i</td>
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<tr>
<td>Even Gates Offset</td>
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</tr>
<tr>
<td>I/Q Imbalance</td>
<td>Bypassed</td>
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<tr>
<td>Complex Conj.</td>
<td>Applied</td>
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### RCS (dBm²) vs. time and range - CFC14-002

### RCS (dBm²Hz⁻¹) at range 2505 m (gate 20) - CFC14-002

---
RCS [dBm² Hz⁻¹] at range 2885 m (gate 40) - CFC14-002

RCS [dBm² Hz⁻¹] at range 3185 m (gate 60) - CFC14-002

RCS [dBm² Hz⁻¹] at range 3485 m (gate 80) - CFC14-002
## Dataset CFC14-003

### Experiment Summary

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<th>Value</th>
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<td><strong>Tx Frequency</strong></td>
</tr>
<tr>
<td>Sea Clutter</td>
<td>9 GHz</td>
</tr>
<tr>
<td><strong>Date</strong></td>
<td><strong>PRF</strong></td>
</tr>
<tr>
<td>31-Jul-2006</td>
<td>5 kHz</td>
</tr>
<tr>
<td><strong>Start Time</strong></td>
<td><strong>Tracking Range</strong></td>
</tr>
<tr>
<td>14:02:31.229</td>
<td>2300 m</td>
</tr>
<tr>
<td><strong>Duration</strong></td>
<td><strong>Range Extend</strong></td>
</tr>
<tr>
<td>85280 PRI's (17.0558 s)</td>
<td>1440 m (96 gates), 15 m res.</td>
</tr>
<tr>
<td><strong>Original File</strong></td>
<td><strong>Waveform Type</strong></td>
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<tr>
<td>PF060731.004</td>
<td>Fixed Frequency</td>
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<td><strong>Original Path</strong></td>
<td><strong>Waveform Bandwidth</strong></td>
</tr>
<tr>
<td>`20060731_ifs_g</td>
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<tr>
<td><strong>Processor Version</strong></td>
<td><strong>Waveform File</strong></td>
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<tr>
<td>FMSCP Ver 01.22</td>
<td>SC_Fixed_256BL.txt</td>
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### Environment

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<tr>
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<th>Geometry</th>
<th>Value</th>
<th>Processing</th>
<th>Value</th>
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<tbody>
<tr>
<td>Inst. Wind</td>
<td>18.3 kts, 151.6 deg. N</td>
<td>Grazing Angle</td>
<td>1.02 - 1.66 deg.</td>
<td>Odd Gates Offset</td>
<td>1.226-0.54518i</td>
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<tr>
<td>Wind Gust</td>
<td>27.8 kts, 159 deg. N</td>
<td>Antenna Azm.</td>
<td>166.4 deg. N</td>
<td>Even Gates Offset</td>
<td>-3.5722+2.4554i</td>
</tr>
<tr>
<td>8hr Avg. Wind</td>
<td>14.3 kts, 170.4 deg. N</td>
<td>Antenna Elv.</td>
<td>-1.187 deg.</td>
<td>I/Q Imbalance</td>
<td>Bypassed</td>
</tr>
<tr>
<td>Wave (SWH)</td>
<td>3 m, 183.2 deg. N</td>
<td>Antenna BW.</td>
<td>1.8 deg. Az, 1.8 deg. El</td>
<td>Complex Conj.</td>
<td>Applied</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GPS Data</td>
<td>Not applicable</td>
<td>Calibr. Coeff.</td>
<td>190.9 dB</td>
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</table>

### Plan View

![Plan Overview of Dataset - CFC14-003](image)

### RCS [dBm² Hz⁻¹] at range 2420 m (gate 9) - CFC14-003

![RCS [dBm² Hz⁻¹] at range 2420 m (gate 9) - CFC14-003](image)
RCS [dBm² Hz⁻¹] at range 2945 m (gate 44) - CFC14-003

RCS [dBm² Hz⁻¹] at range 3365 m (gate 72) - CFC14-003
Dataset CFC14-004

Experiment Summary

<table>
<thead>
<tr>
<th>Experiment Summary</th>
<th>Value</th>
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<th>Value</th>
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<tbody>
<tr>
<td>Type</td>
<td>Sea Clutter</td>
<td>Tx Frequency</td>
<td>9 GHz</td>
</tr>
<tr>
<td>Date</td>
<td>31-Jul-2006</td>
<td>PRF</td>
<td>5 kHz</td>
</tr>
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<td>Start Time</td>
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<td>Tracking Range</td>
<td>3600.31 m</td>
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<td>1440 m (96 gates), 15 m res.</td>
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<td>Processor Version</td>
<td>FMSCP Ver 01.22</td>
<td>Waveform File</td>
<td>SC_Fixed_256BL.txt</td>
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Environmental Conditions

<table>
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<tr>
<th>Environment</th>
<th>Value</th>
<th>Geometry</th>
<th>Value</th>
<th>Processing</th>
<th>Value</th>
</tr>
</thead>
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<tr>
<td>Wind Gust</td>
<td>27.8 kts, 159 deg. N</td>
<td>Antenna Azm.</td>
<td>166.4 deg. N</td>
<td>Even Gates Offset</td>
<td>1.3995-0.62997i</td>
</tr>
<tr>
<td>8hr Avg. Wind</td>
<td>14.4 kts, 170.3 deg. N</td>
<td>Antenna Elv.</td>
<td>-1.187 deg.</td>
<td>I/Q Imbalance</td>
<td>Bypassed</td>
</tr>
<tr>
<td>Wave (SWH)</td>
<td>3 m, 183 deg. N</td>
<td>Antenna BW.</td>
<td>1.8 deg. Az, 1.8 deg. El</td>
<td>Complex Conj.</td>
<td>Applied</td>
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<tr>
<td></td>
<td></td>
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<td>Not applicable</td>
<td>Calibr. Coef.</td>
<td>190.9 dB</td>
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Doppler Shift

RCS [dBm^2] vs. time and range - CFC14-004

RCS [dBm^2:Hz^{-1}] at range 3885.3125 m (gate 20) - CFC14-00-
**RCS [dBm^2.Hz\(^{-1}\)] at range 4185.3125 m (gate 40) - CFC14-004**

- Time [s]
- Doppler Shift [Hz]
- RCS [dBm^2.Hz\(^{-1}\)]

**RCS [dBm^2.Hz\(^{-1}\)] at range 4485.3125 m (gate 60) - CFC14-004**

- Time [s]
- Doppler Shift [Hz]
- RCS [dBm^2.Hz\(^{-1}\)]

**RCS [dBm^2.Hz\(^{-1}\)] at range 4785.3125 m (gate 80) - CFC14-004**

- Time [s]
- Doppler Shift [Hz]
- RCS [dBm^2.Hz\(^{-1}\)]
**Dataset CFC14-005**

### Experiment Summary

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<td>Date</td>
<td>31-Jul-2006</td>
<td>PRF</td>
<td>5 kHz</td>
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<td>Start Time</td>
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<td>4900.63 m</td>
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<tr>
<td>Duration</td>
<td>510480 PRI's (102.0958 s)</td>
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<td>1440 m (96 gates), 15 m res.</td>
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<tr>
<td>Original File</td>
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<td>Original Path</td>
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### Environment

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<th>Processing</th>
<th>Value</th>
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<tr>
<td>Wind Gust</td>
<td>18.2 kts, 150.4 deg. N</td>
<td>0.586 - 0.767 deg.</td>
<td>Odd Gates Offset</td>
<td>1.4968-0.61417i</td>
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<tr>
<td>Wind Gust</td>
<td>27.8 kts, 159 deg. N</td>
<td>Antenna Azm. 166.4 deg. N</td>
<td>Even Gates Offset</td>
<td>-3.0914+3.1064i</td>
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<td>8hr Avg. Wind</td>
<td>14.8 kts, 169.3 deg. N</td>
<td>Antenna Elv. -1.189 deg.</td>
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<tr>
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<td>3 m, 182.2 deg. N</td>
<td>Antenna BW. 1.8 deg. Az, 1.8 deg. El</td>
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<td>Applied</td>
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### Diagrams

- RCS vs. time and range - CFC14-005
- Plan Overview - CFC14-005
- Doppler Shift vs. time - CFC14-005
### Experiment Summary

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<td>PRF</td>
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### Environment

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<td>Inst. Wind</td>
<td>18.2 kts, 150.3 deg. N</td>
<td>Grazing Angle</td>
<td>0.586 - 0.767 deg.</td>
<td>Odd Gates Offset</td>
<td>1.4989-0.59317i</td>
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<td>Wind Gust</td>
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<td>Antenna Azm.</td>
<td>166.4 deg. N</td>
<td>Even Gates Offset</td>
<td>-3.0471+3.1778i</td>
</tr>
<tr>
<td>8hr Avg. Wind</td>
<td>14.9 kts, 169.1 deg. N</td>
<td>Antenna Elv.</td>
<td>-1.189 deg.</td>
<td>I/Q Imbalance</td>
<td>Bypassed</td>
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<tr>
<td>Wave (SWH)</td>
<td>3 m, 182.1 deg. N</td>
<td>Antenna BW.</td>
<td>1.8 deg. Az, 1.8 deg. El</td>
<td>Complex Conj.</td>
<td>Applied</td>
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<td>GPS Data</td>
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<td>Calibr. Coeff.</td>
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### Additional Information

- **Dataset CFC14-006**
- **RCS [dBm²] vs. time and range - CFC14-006**
- **Plan Overview of Dataset - CFC14-006**
- **RCS [dBm² Hz⁻¹] at range 5185.625 m (gate 20) - CFC14-006**
RCS [dBm² Hz⁻¹] at range 5485.625 m (gate 40) - CFC14-006

RCS [dBm² Hz⁻¹] at range 5785.625 m (gate 60) - CFC14-006

RCS [dBm² Hz⁻¹] at range 6085.625 m (gate 80) - CFC14-006
Dataset CFC14-007

Experiment Summary

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<td>Date</td>
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<tr>
<td>Start Time</td>
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Radar Setup

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<td>9 GHz</td>
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<tr>
<td>PRF</td>
<td>5 kHz</td>
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<tr>
<td>Tracking Range</td>
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<tr>
<td>Range Extend</td>
<td>1440 m (96 gates), 15 m res.</td>
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Environment

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<th>Value</th>
<th>Processing</th>
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<td>18.1 kts, 150.3 deg. N</td>
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<td>Antenna Azm.</td>
<td>166.5 deg. N</td>
<td>Even Gates Offset</td>
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<tr>
<td>8hr Avg. Wind</td>
<td>15.1 kts, 168.7 deg. N</td>
<td>Antenna Elv.</td>
<td>-1.176 deg.</td>
<td>I/Q Imbalance</td>
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<td>Wave (SWH)</td>
<td>3 m, 181.8 deg. N</td>
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<td>1.8 deg. Az, 1.8 deg. El</td>
<td>Complex Conj.</td>
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<td>GPS Data</td>
<td>Not applicable</td>
<td>Calibr. Coeff.</td>
<td>190.9 dB</td>
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Plan Overview of Dataset - CFC14-007

RCS [dBm^2] vs. time and range - CFC14-007

RCS [dBm^2 Hz^-1] at range 6485 m (gate 20) - CFC14-007

Doppler Shift [Hz]

Time [s]
Dataset CFC14-008

RCS [dBm²] vs. time and range - CFC14-008

<table>
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<th>Experiment Summary</th>
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<td>PRF</td>
<td>5 kHz</td>
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<tr>
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<td>27.8 kts, 159 deg. N</td>
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<tr>
<td>8hr Avg. Wind</td>
<td>15.2 kts, 168.4 deg. N</td>
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<td>Wave (SWH)</td>
<td>2.99 m, 181.5 deg. N</td>
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<tr>
<td>Inst. Wind</td>
<td>18 kts, 150.4 deg. N</td>
</tr>
<tr>
<td>Wind Gust</td>
<td>27.8 kts, 159 deg. N</td>
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<tr>
<td>8hr Avg. Wind</td>
<td>15.2 kts, 168.4 deg. N</td>
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<tr>
<td>Wave (SWH)</td>
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<tr>
<td>Antenna Elv.</td>
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<tr>
<td>Antenna Elv.</td>
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<td>Complex Conj.</td>
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<tr>
<td>Calibr. Coeff.</td>
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### Dataset CFC14-009

![RCS vs time and range - CFC14-009](image)

**Experiment Summary**

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<tr>
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<tr>
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**Environment**

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<th><strong>Processing</strong></th>
<th><strong>Value</strong></th>
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</thead>
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<td>Antenna Azm.</td>
<td>166.4 deg. N</td>
<td>Even Gates Offset</td>
<td>-2.9781+3.4259i</td>
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<tr>
<td>8hr Avg. Wind</td>
<td>15.4 kts, 168 deg. N</td>
<td>Antenna Elv.</td>
<td>-1.184 deg.</td>
<td>I/Q Imbalance</td>
<td>Bypassed</td>
</tr>
<tr>
<td>Wave (SWH)</td>
<td>2.99 m, 181.2 deg. N</td>
<td>Antenna BW.</td>
<td>1.8 deg. Az, 1.8 deg. El</td>
<td>Complex Conj.</td>
<td>Applied</td>
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![Plan Overview of Dataset - CFC14-009](image)

**RCS [dBrn^2.Hz^{-1}] at range 9085 9375 m (gate 20) - CFC14-001**

![Doppler Shift [Hz]](image)
# Dataset CFE14-001

![RCS vs. time and range](image)

## Experiment Summary

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<td>Sea Clutter</td>
</tr>
<tr>
<td><strong>Date</strong></td>
<td>31-Jul-2006</td>
</tr>
<tr>
<td><strong>Start Time</strong></td>
<td>17:18:08.953</td>
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<td><strong>Duration</strong></td>
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<td><strong>Tracking Range Extend</strong></td>
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## Radar Setup

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</tr>
<tr>
<td><strong>Duration</strong></td>
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</tr>
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<td><strong>Original File</strong></td>
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## Waveform File

- **SC_Fixed_256BL.txt**

## Environment

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<td><strong>Inst. Wind</strong></td>
<td>12.5 kts, 135.9 deg. N</td>
</tr>
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<td><strong>Wind Gust</strong></td>
<td>18.7 kts, 143 deg. N</td>
</tr>
<tr>
<td><strong>8hr Avg. Wind</strong></td>
<td>19.4 kts, 159.8 deg. N</td>
</tr>
<tr>
<td><strong>Wave (SWH)</strong></td>
<td>3.11 m, 183.4 deg. N</td>
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<td><strong>Grazing Angle</strong></td>
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</tr>
<tr>
<td><strong>Antenna Elv.</strong></td>
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</tr>
<tr>
<td><strong>Antenna BW.</strong></td>
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<td><strong>GPS Data</strong></td>
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## Processing

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<td>Bypassed</td>
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<td>Applied</td>
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<td><strong>Calibr. Coeff.</strong></td>
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![Plan Overview of Dataset - CFE14-001](image)

![Doppler Shift vs. time](image)