Adaptive IIR-notch filter for RFI suppression in a radio detection of cosmic
Setup and freq. characteristics

\[ y_k = x_k - (Ax_{k-1}) + x_{k-2} + (Ay_{k-1}) - (r^2y_{k-2}) \]

Frequency characteristics of the AERA IIR filter

Frequency characteristics of IIR filter for various parameter r
Suppression efficiency

|FFT| for ADC input

|FFT| for IIR output (r = 0.95)

|FFT| for IIR output (r = 0.90)

|FFT| for IIR output (r = 0.99)
Timing and distortions

Duration of processes for EP4CE115F29C7 and 5CEFA9F31I7

<table>
<thead>
<tr>
<th>Processes</th>
<th>time (ms)</th>
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<tbody>
<tr>
<td>A transfer of 4096 samples from the DP-RAM to NIOS®</td>
<td>~9.7</td>
</tr>
<tr>
<td>Calculation of 4096-point FFT by Danielson-Lanczos algo.</td>
<td>~618</td>
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<tr>
<td>Calculation of FFT modules</td>
<td>~97</td>
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<td>Calculation and transfer of IIR coefficients for 4 sub-filters</td>
<td>~13.4</td>
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![Graph A](image1.png)  
**Graph A:** |FFT| of selected ADC waveforms

![Graph B](image2.png)  
**Graph B:** Selected ADC waveforms