**Narrow band interference elimination based on compressed sensing in UWB energy detector**

**List of tables**

TABLE 1 Comparison of direct compressed and reconstruction based UWB energy detector [10]

|  |  |  |
| --- | --- | --- |
| **Features** | **Direct compressed energy detector** | **Reconstruction based energy detector** |
| Type of samples | Compressed samples | Reconstructed samples |
| Timing information | Cannot be relaxed | Can be relaxed |
| Measurement process | Identical | Independent |
| Theoretical BEP | Requires orthogonal measurement matrix | Requires random measurement matrix |

TABLE 2 comparisons of NBI mitigation methods

|  |  |  |
| --- | --- | --- |
| **Features** | **[15]** | **[11]** |
| Pulsing rate | independent | Low |
| Timing issue | Robust | Requires perfect timing |
| Discrete cosine transform (DCT) | Do not require | Requires |
| Domain of CS ensembles | Fourier | Time |

**List of figures**

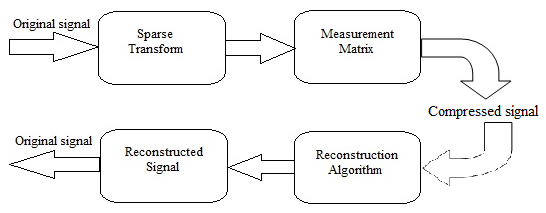
****

Fig. 1 Process of compressed sensing theory

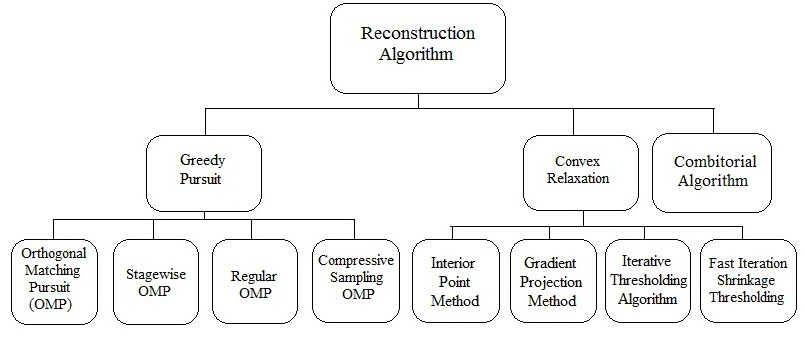
****

Fig. 2 Classifications of reconstruction algorithms in CS theory.

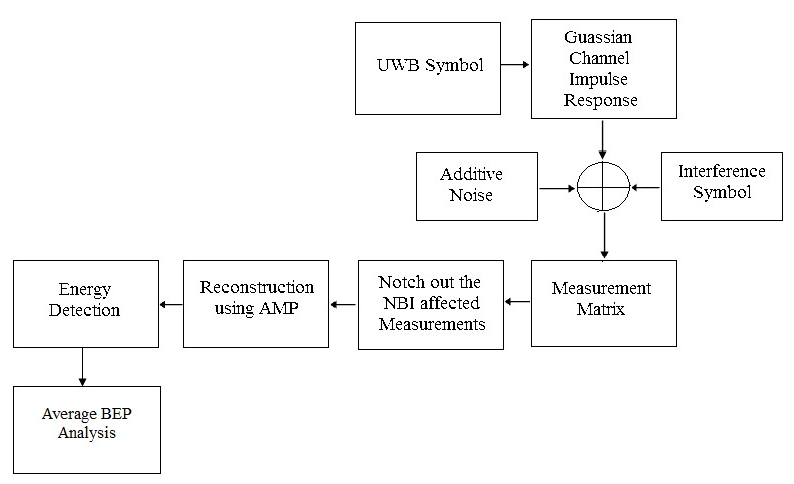


Fig.3 Block diagram of NBI robust UWB energy detector.

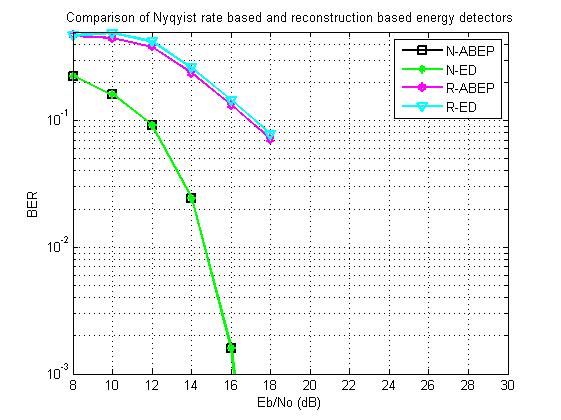


Fig.4 Comparison of Nyquist Rate and reconstruction based energy detectors w.r.t. Eb/No.

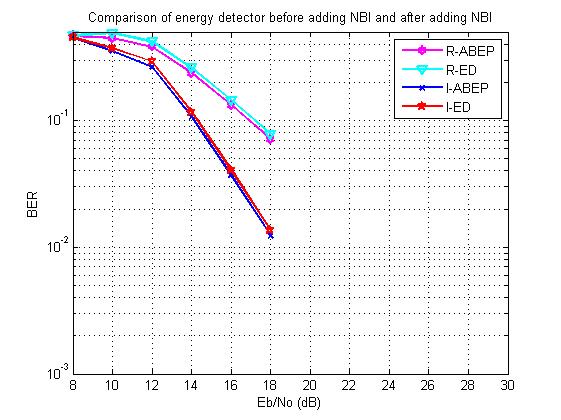


Fig.5 Effect of NBI on reconstruction based energy detector w.r.t. Eb/No.

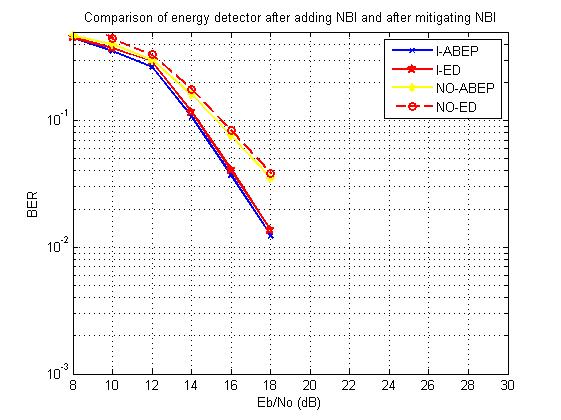


Fig. 6 Comparison of detectors in the presence of NBI and after mitigating NBI w.r.t. Eb/No

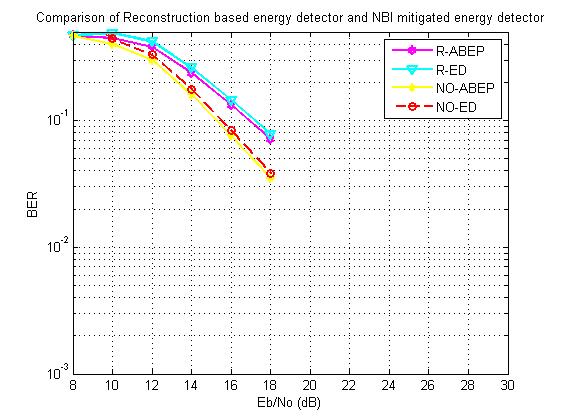


Fig. 7 Comparison of detectors in the abcence of NBI and after notching out NBI w.r.t. Eb/No.

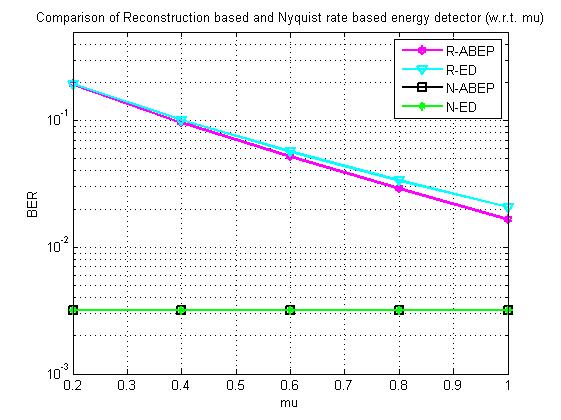
****

Fig.8 Comparison of Nyquist rate energy detector and compressed sampling based energy detector w.r.t. mu.

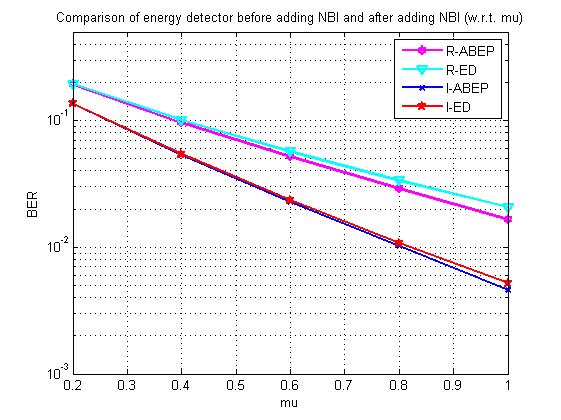
****

Fig.9 Comparison of energy detector in the absence of and in the presence of NBI w.r.t. mu

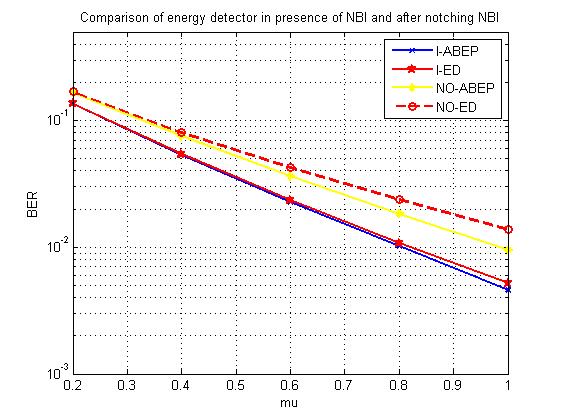
****

Fig.10 Comparison of energy detector in the presence of NBI and after mitigating NBI.

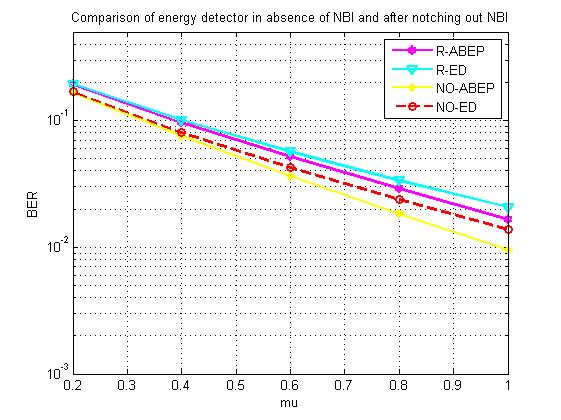
****

Fig.11 Comparison of energy detector in the absence of NBI and after mitigating NBI w.r.t mu.