Table I compares the complexities of different receivers in terms of the number of real-valued multiplications and additions for getting all LLR values per RE/subcarrier. Note that $n_r$ denotes the number of receive antennas. This complexity analysis is independent of the number of transmit antennas as the operation of finding effective channels bears same complexity in all receiver structures. Moreover UEs can also directly estimate their effective channels if the pilot signals are also precoded. The comparison shows that the complexity of the interference-aware receiver is of the same order as of single-user receiver while it is far less than the complexity of the max log MAP receiver. Fig. 2 further shows the performance-complexity trade off of different receivers for multi-user MIMO mode in LTE. The performance of the receivers is measured in terms of the SNR at the frame error rate (FER) of $10^{-2}$ whereas the complexity is determined from Table I. It shows that the performance of the single-user receiver is severely degraded as compared to that of the interference-aware receiver. In most cases, the single-user receiver fails to achieve the requisite FER in the considered SNR range. On the other hand, interference-aware receiver achieves same performance as max log MAP receiver but with much reduced complexity.

\[
\begin{aligned}
& \frac{1}{n_r} \left( y_1, c_k \right) \left\{ \begin{array}{c} \frac{1}{n_r} \left( \left| \rho_{12} \right|^{2} - \sigma_{2}^{2} + \| h_{1} p_{1} \|^2 N_{0} \right) | y_1 | \left| \begin{array}{l} P_{1} \end{array} \right| \end{array} \right\} \\
\end{aligned}
\]