

3GPP TSG RAN WG1 Meeting #87
Reno, USA, 14th – 18th November 2016
Agenda Item: 7.1.5.1

R1-1613347

WF on channel codes for NR short block length eMBB data

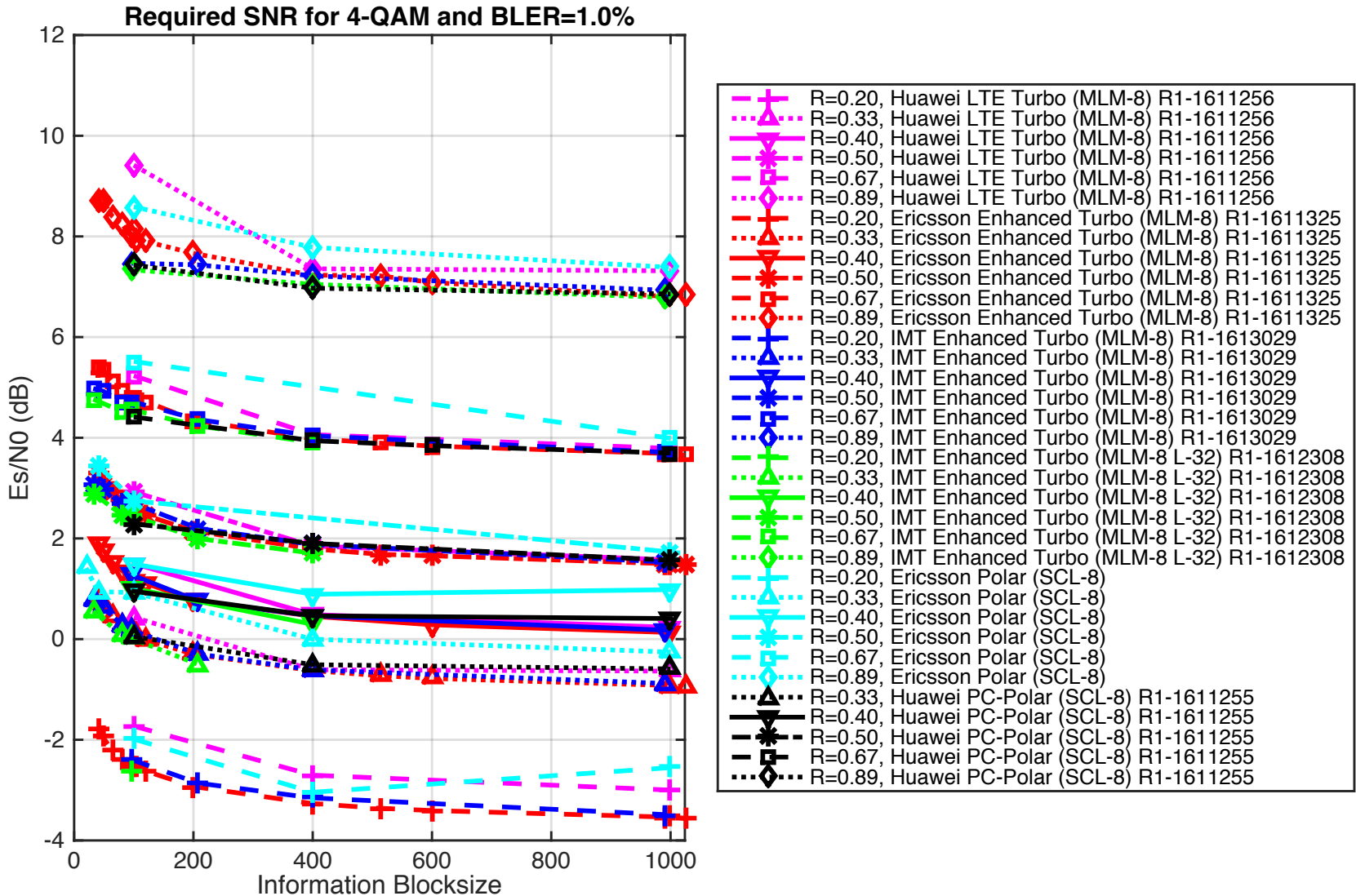
AccelerComm, Ericsson, Orange, IMT, LG Electronics, NEC

Background

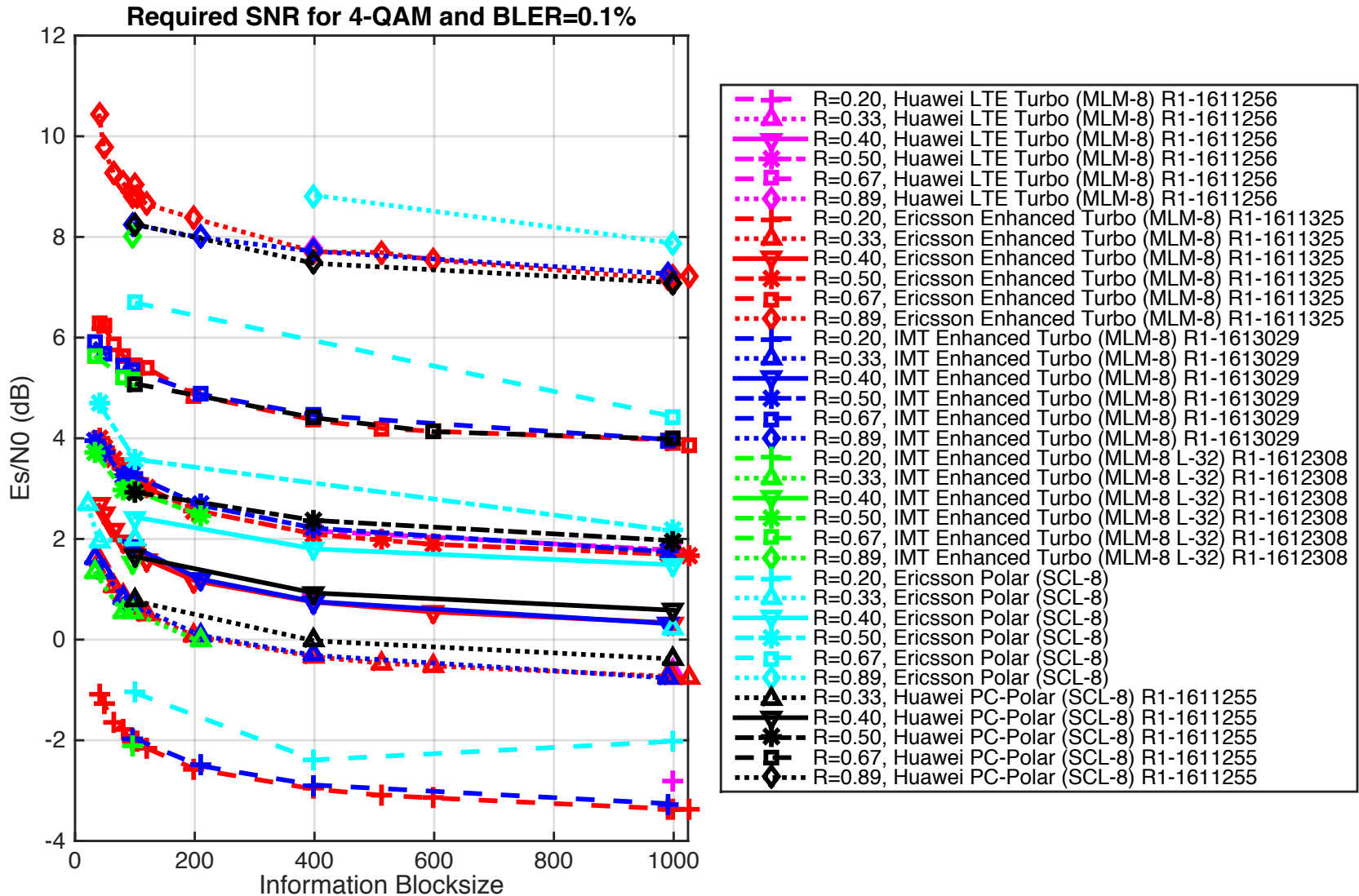
Agreement at RAN1#86bis:

- The channel coding scheme for eMBB data is LDPC, at least for information block size $> X$
- FFS until RAN1#87 one of Polar, LDPC, Turbo is supported for information block size of eMBB data $\leq X$
 - The selection will focus on all categories of observation, including overall implementation complexity, regardless of the number of coding schemes in the resulting solution (except if other factors are generally roughly equal)
- The value of X is FFS until RAN1#87, $128 \leq X \leq 1024$ bits, taking complexity into account
- The channel coding scheme(s) for URLLC, mMTC and control channels are FFS

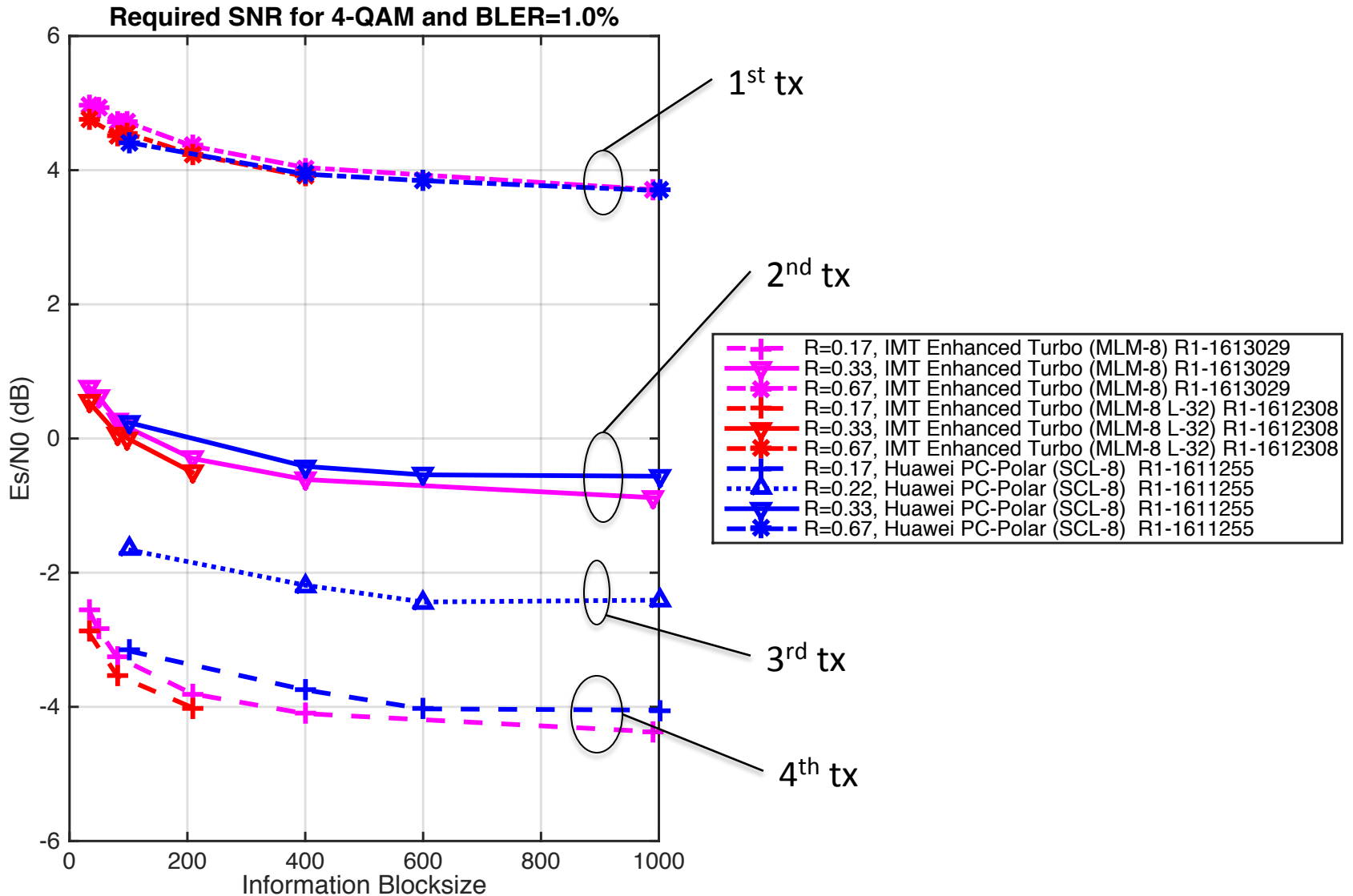
BLER performance on first tx



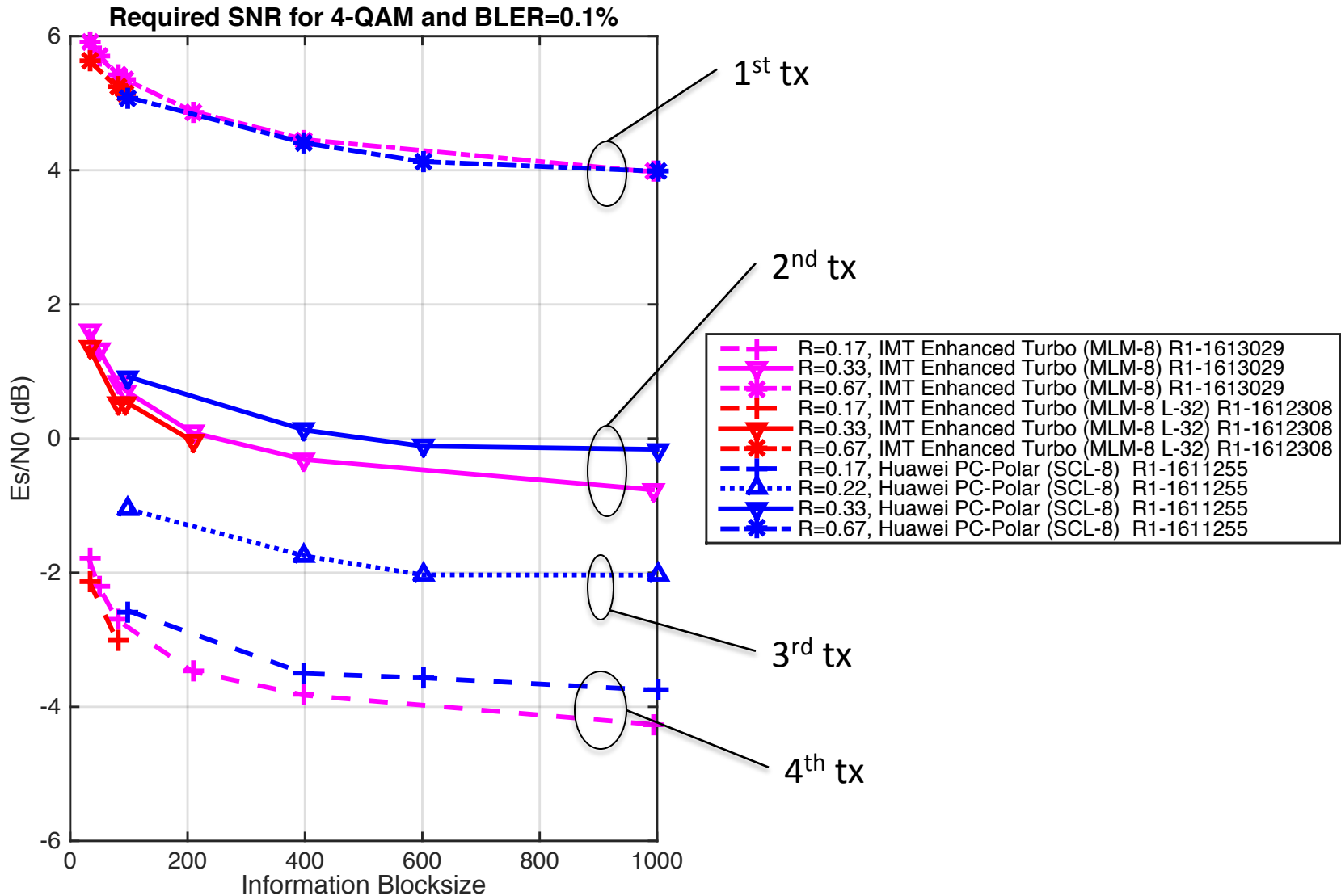
...at lower BLER



BLER performance on subsequent tx



...at lower BLER



Observations

- Enhanced turbo (MLM-8) has similar complexity to LTE turbo (MLM-8), which is widely implemented
- Enhanced turbo (MLM-8) offers superior BLER to LTE turbo (MLM-8)
- Enhanced turbo (MLM-8) offers superior BLER to polar (SCL-8)
- Enhanced turbo (MLM-8) offers similar BLER performance as first transmission of rate-compatible PC-polar (SCL-8)
 - Initial investigations suggest that enhanced turbo (MLM-8) offers superior BLER performance in subsequent transmissions
- Enhanced turbo (MLM-8) has a steeper BLER curve than PC-polar (SCL-8)
- Enhanced turbo naturally offers rate compatible IR-HARQ

Proposal

Turbo code is adopted for information block size of eMBB data ≤ 1024

Note: if some system design constraints are found during the work item, it may be desirable to revisit the value of 1024