

Synopsis of FEC Contributions

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Purpose:

Present a synopsis of the FEC contributions for 802.16.1.

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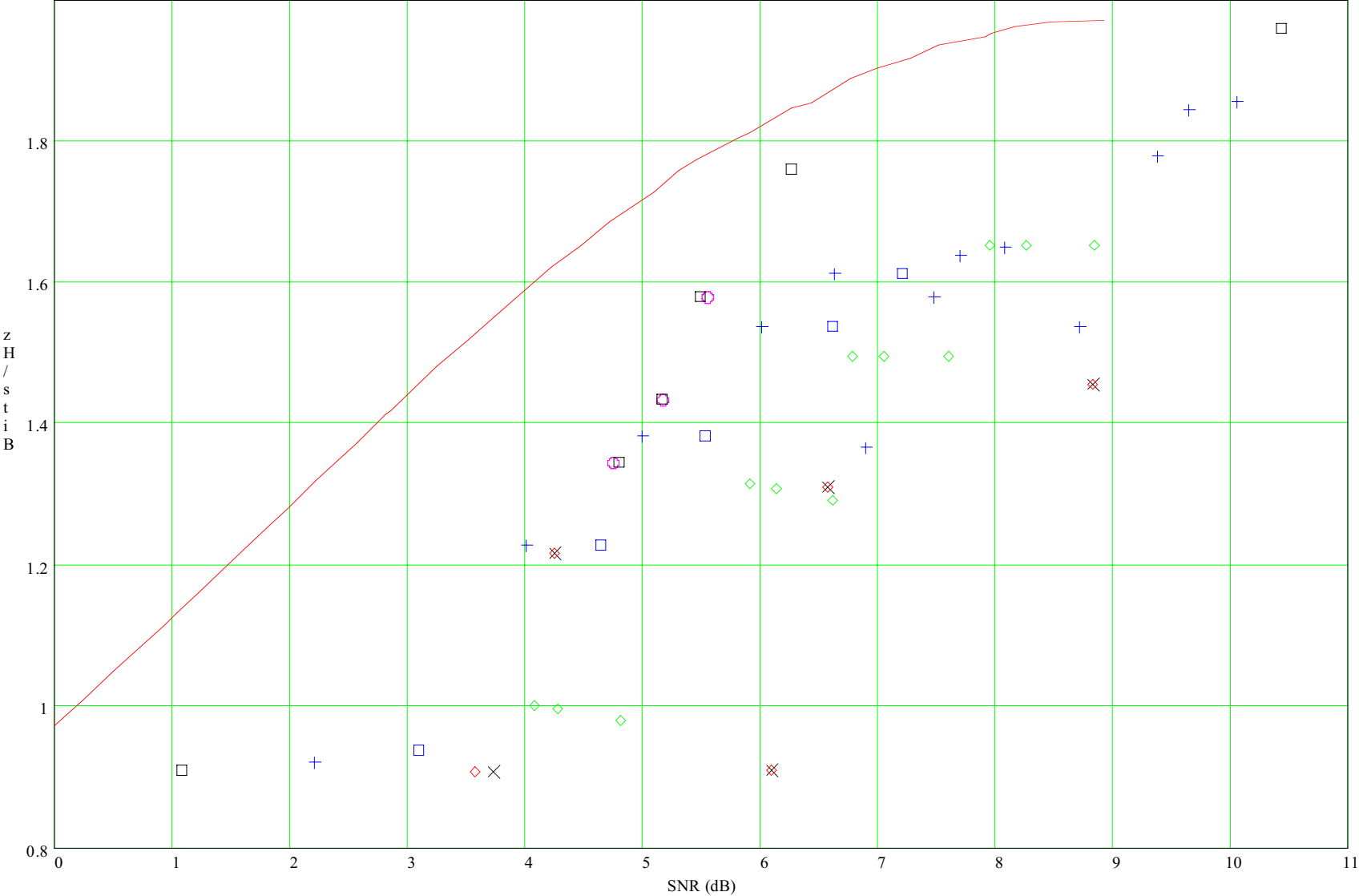
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IEEE 802.16.1 FEC Candidates

- *Preliminary* comparisons
- Author Key:
 - FL = Foerster-Liebetreu
 - RW = Ran-Williams
 - Wil = Williams
 - QH = Hongyi

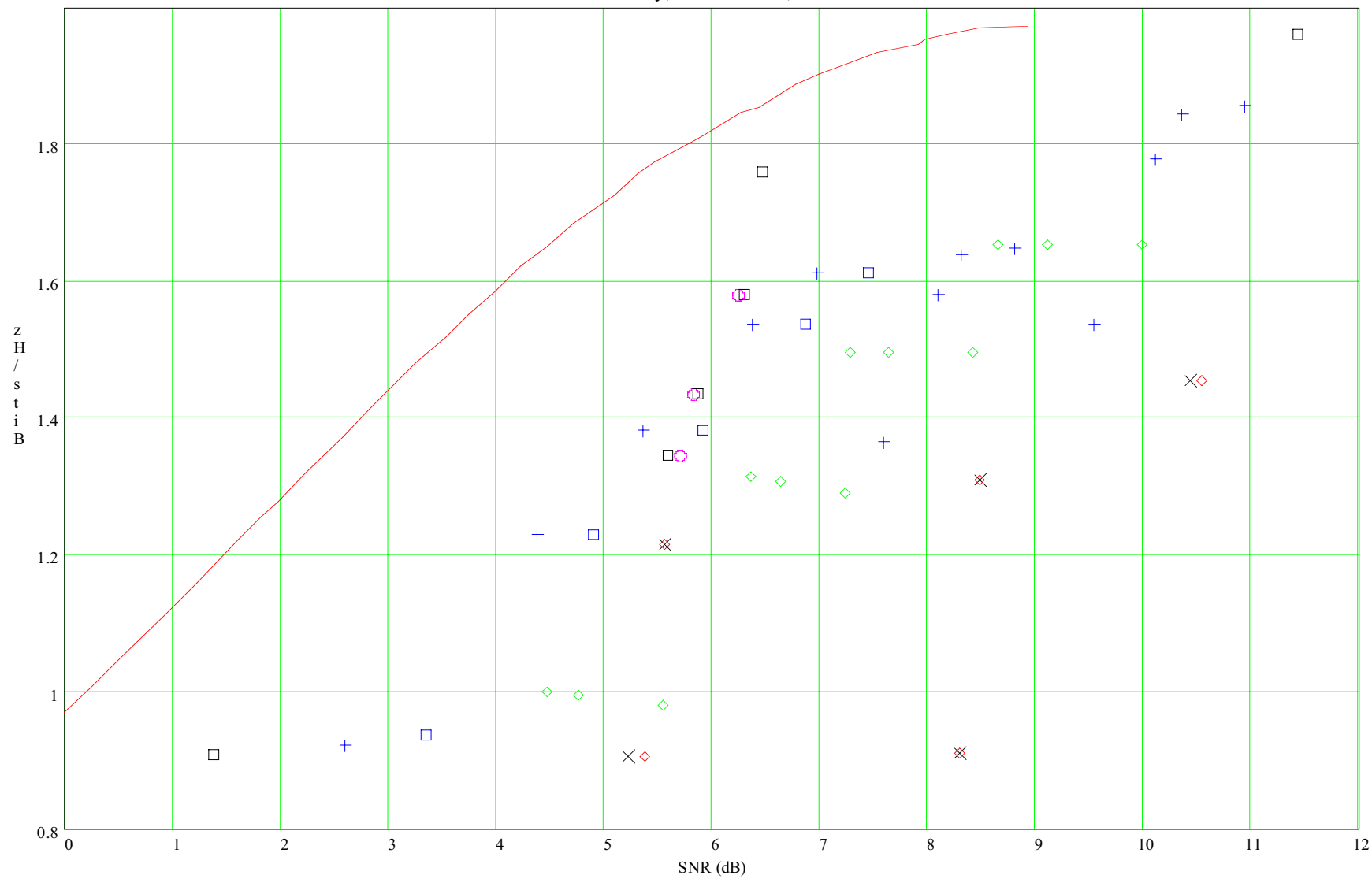
Prepared by Eric Jacobsen

BW-Efficiency, 802.16.1 FEC, Pe = 10E-6



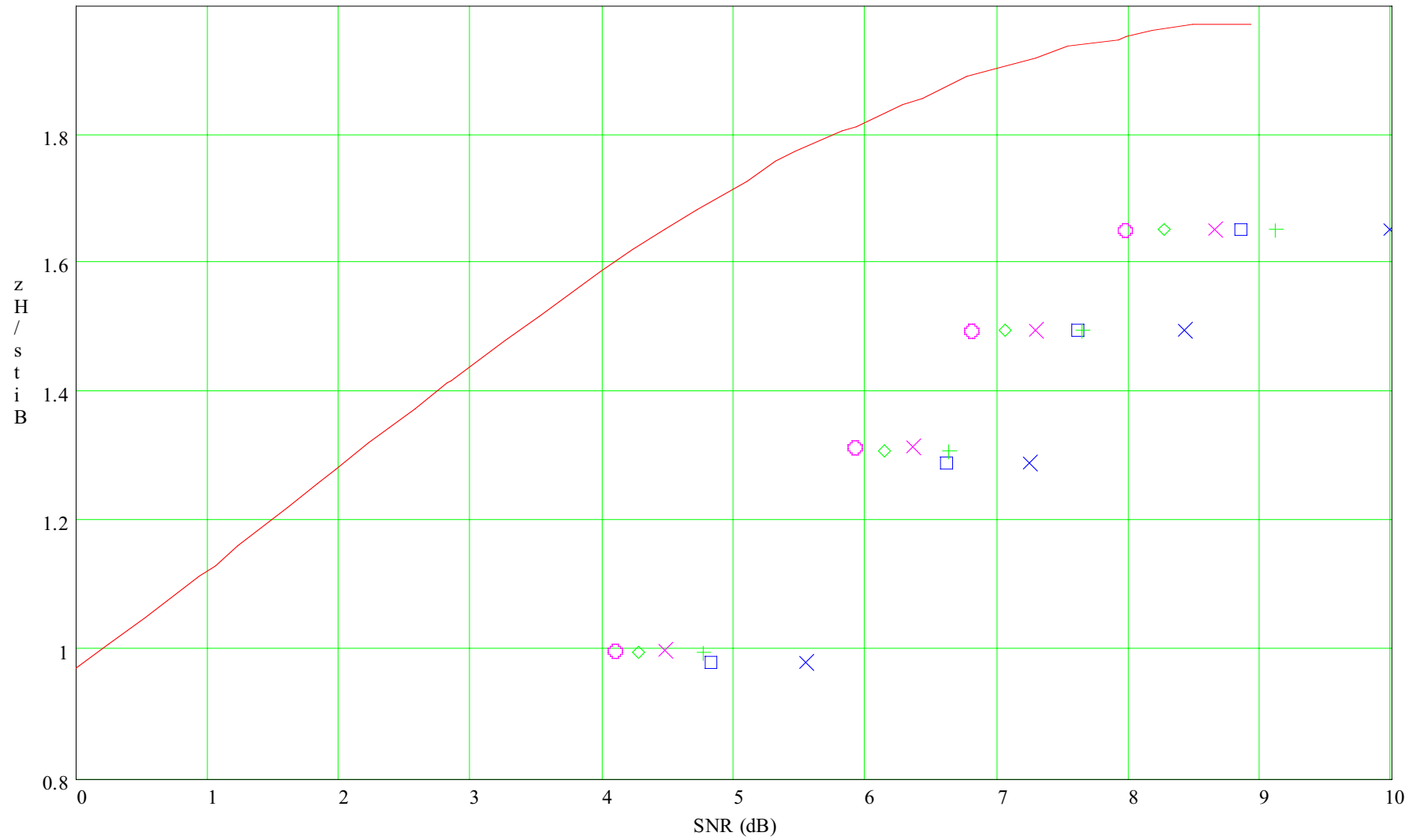
- BICO Capacity
- FL
- ◇ Gupta
- RWdl
- ×× RWul
- WiDL
- ◇ WiUL
- +++ QH

BW-Efficiency, 802.16.1 FEC, $P_e = 10E-9$



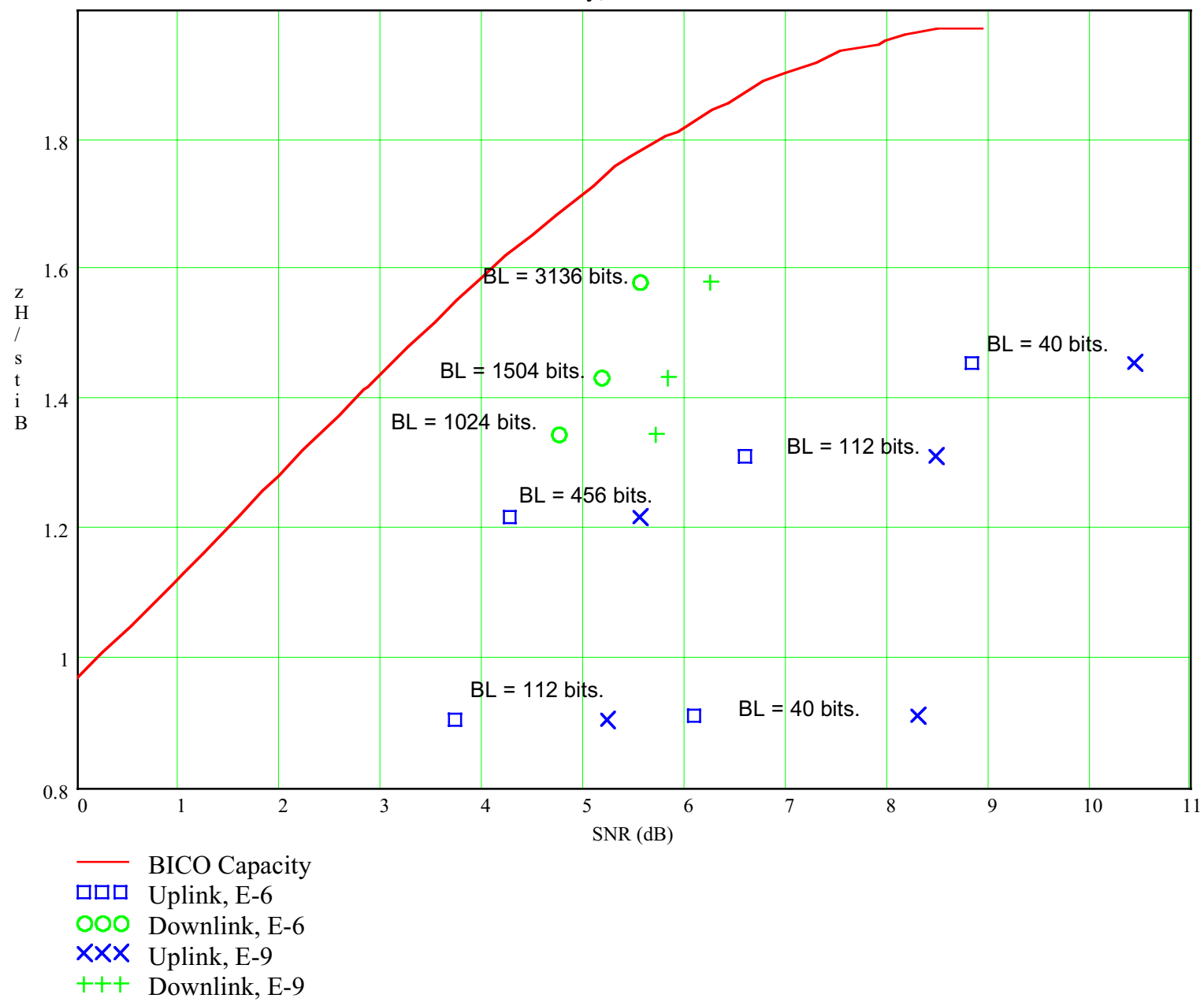
- BICO Capacity
- FL
- ◇ Gupta
- RWdl
- ××× RWul
- WiDL
- ◇ WiUL
- +++ QH

BW-Efficiency, Gupta codes.

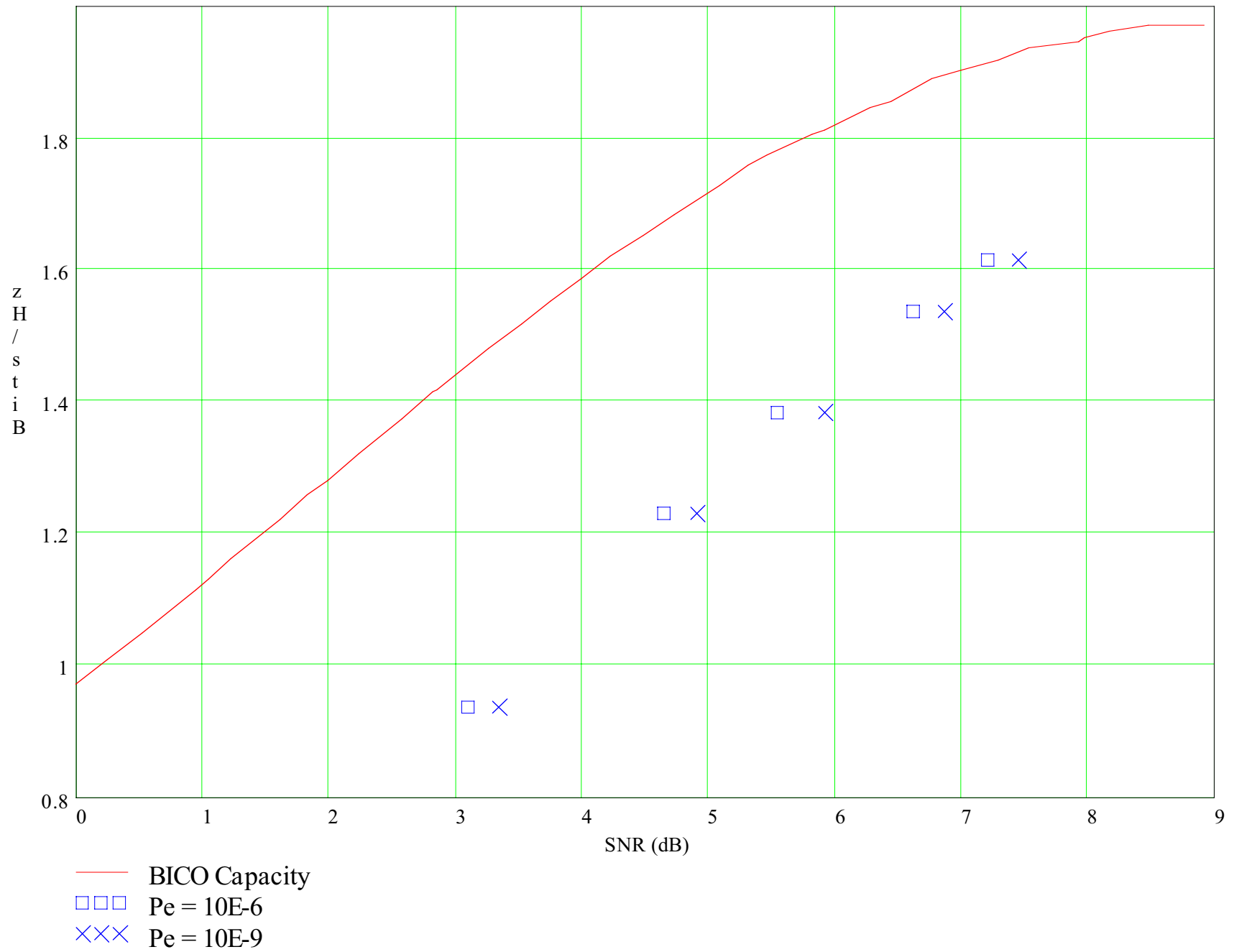


- BICO Capacity
- □ □ BL = 424, E-6
- ◇ BL = 848, E-6
- ○ ○ BL = 1272, E-6
- × × × BL = 424, E-9
- + + + BL = 848, E-9
- × × × BL = 1272, E-9

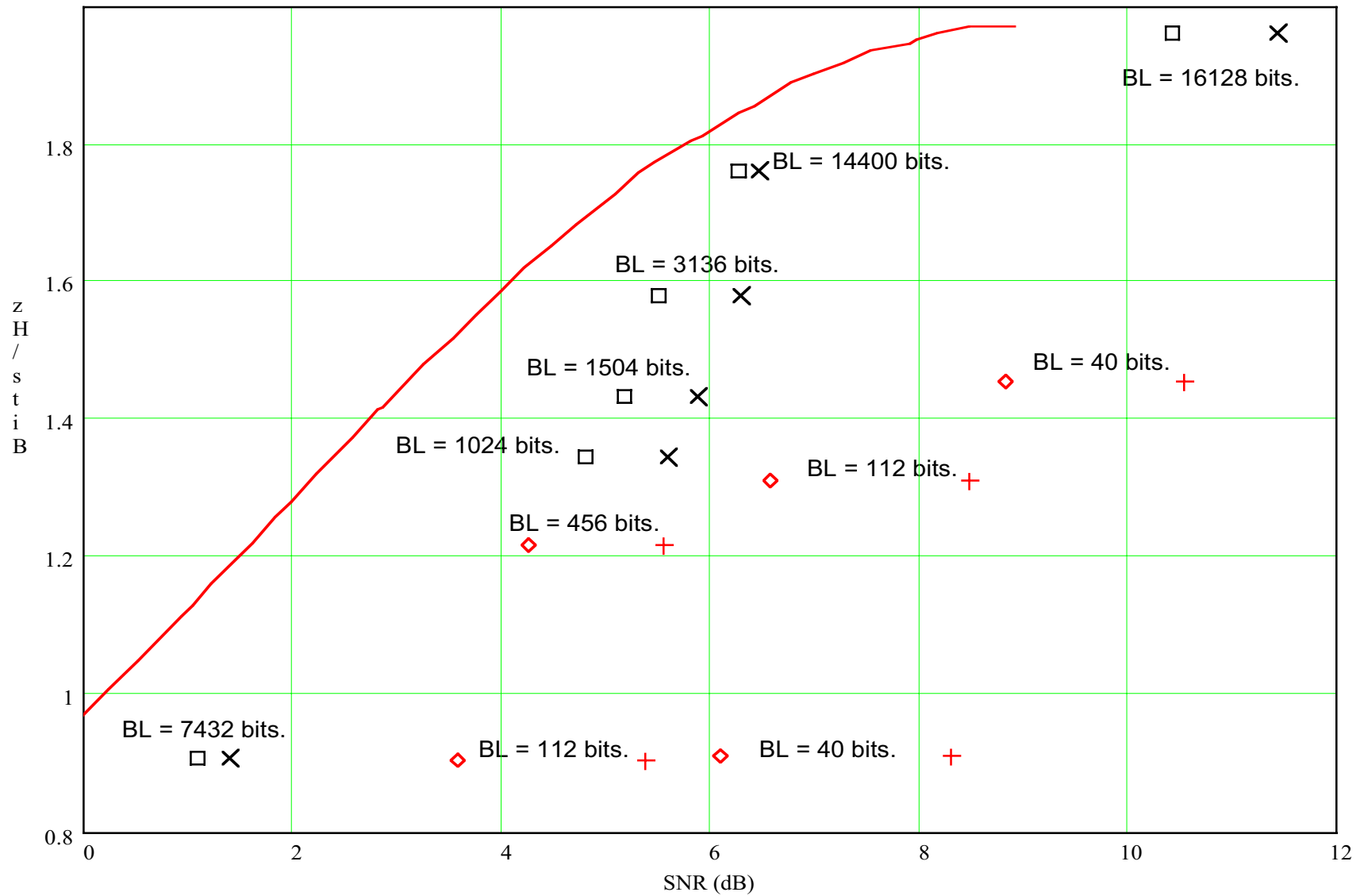
BW-Efficiency, Ran-Williams codes.



BW-Efficiency, Foerster-Liebetreu codes.

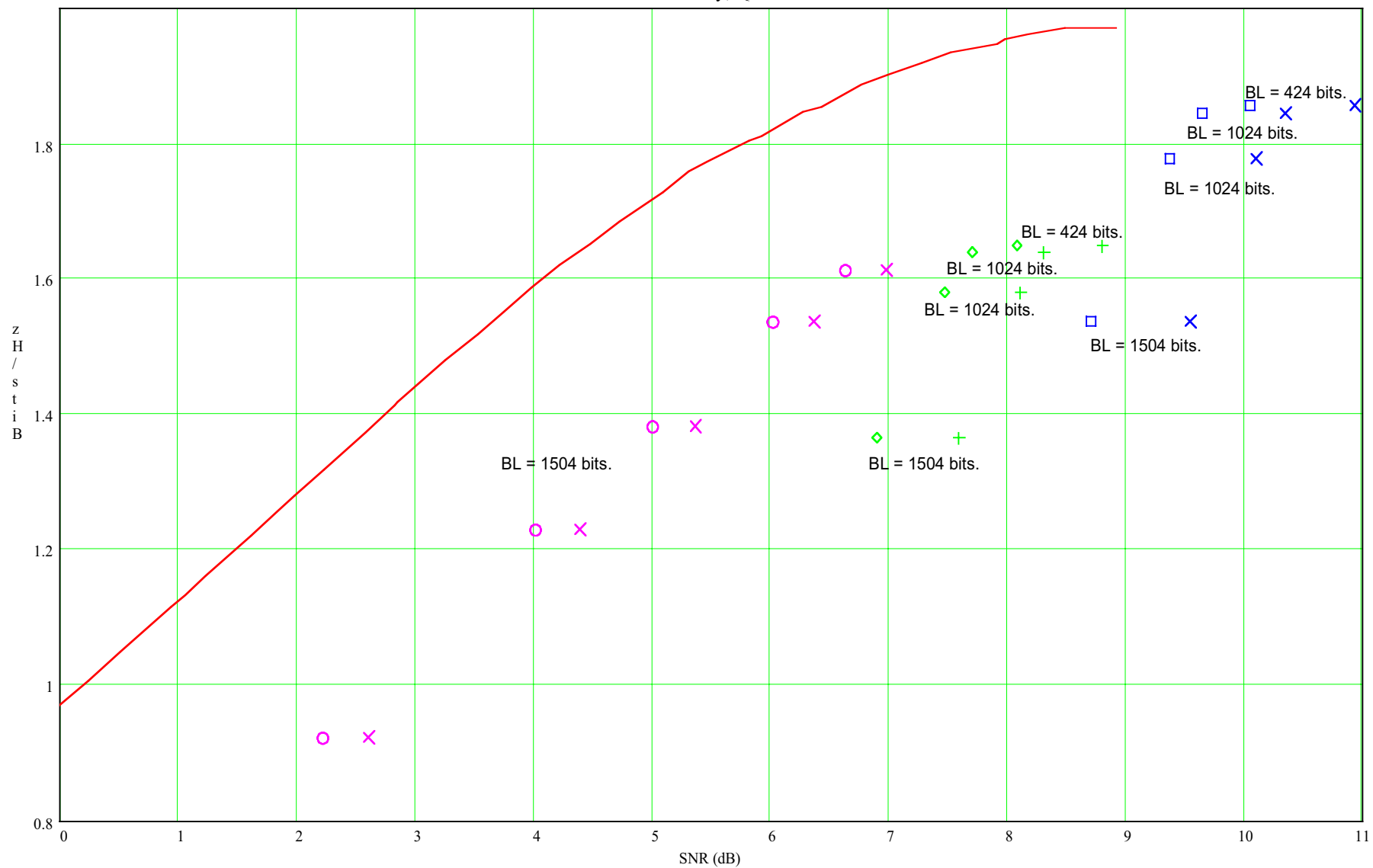


BW-Efficiency, Williams codes.



- BICO Capacity
- \diamond Uplink, E-6
- \square Downlink, E-6
- $++$ Uplink, E-9
- \times Downlink, E-9

BW-Efficiency, QH codes.



- BICO Capacity
- RS, E-6
- ◇ RS+parity, E-6
- RS+conv, E-6
- × RS, E-9
- ++ RS+parity, E-9
- ×× RS+conv, E-9

Implementation Complexity

Code	Encoder	Decoder
Ran-Williams	UL = 10kg-300kg	DL = <400kg
Gupta	2kg	28kg-32kg
Williams	10kg-15kg	150kg-250kg
Foerster-Liebetreu	11kg, 16kb RAM (107ekg)	94kg, 27kb RAM (256ekg)

Latency

Code	Latency
Ran-Williams DL	T _x , <0.1us R _x , <2 blocks
Ran-Williams UL	<3 blocks
Gupta, BL = 424	888 bits
Gupta, BL = 848	1728 bits
Gupta, BL = 1272	2576 bits
Foerster-Liebetreu	16544 bits + decoder dly