**Student:** Ty Davis

**Course:** ECE 5420

**Subject:** Programming Assignment 3 - Binary Antipodal Modulation

**Date:** October 16, 2025

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The following are the values that I calculated for the assignment.

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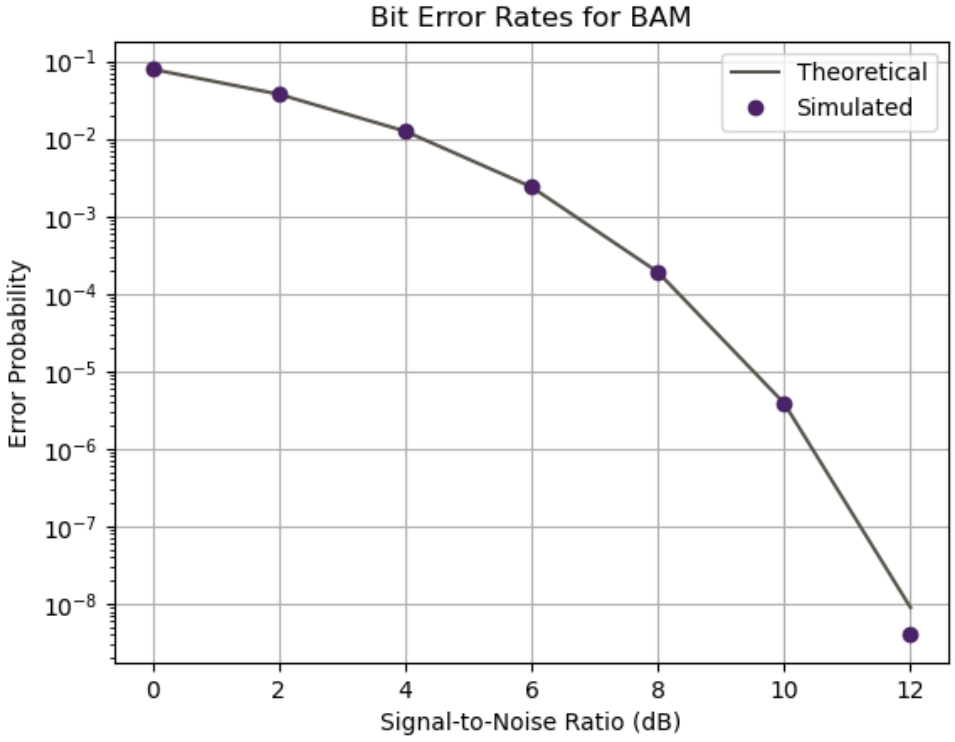
|---|---|---|---|---|---|---|---|
| $E_p$ | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $N_0$ | 1.000 | 0.631 | 0.398 | 0.251 | 0.158 | 0.100 | 0.063 |
| $\frac{E_p}{N_0}$ | 1.000 | 1.585 | 2.512 | 3.981 | 6.310 | 10.000 | 15.849 |
| $\frac{E_p}{N_0}$ in dB | 0.000 | 2.000 | 4.000 | 6.000 | 8.000 | 10.000 | 12.000 |
| $P_b$ in $Q$ function | 1.414 | 1.780 | 2.241 | 2.822 | 3.552 | 4.472 | 5.630 |
| $P_b$ Theoretical | 7.8650e-02 | 3.7506e-02 | 1.2501e-02 | 2.3883e-03 | 1.9091e-04 | 3.8721e-06 | 9.0060e-09 |
| $P_b$ Simulation | 7.8653e-02 | 3.7507e-02 | 1.2500e-02 | 2.3904e-03 | 1.9147e-04 | 3.8790e-06 | 4.0000e-09 |




Output from the Python script:

```
SIM: 7.8653e-02   THEORY: 7.8650e-02
SIM: 3.7507e-02   THEORY: 3.7506e-02
SIM: 1.2500e-02   THEORY: 1.2501e-02
SIM: 2.3904e-03   THEORY: 2.3883e-03
SIM: 1.9147e-04   THEORY: 1.9091e-04
SIM: 3.8790e-06   THEORY: 3.8721e-06
SIM: 4.0000e-09   THEORY: 9.0060e-09
```