Mathematics Experiment Report

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USN:

Section:

3D Hit Probability Distribution

Results:

Mean Vector:

[10, 20, 15]

Covariance Matrix:

[4, 1, 1]

[1, 3, 1]

[1, 1, 2]

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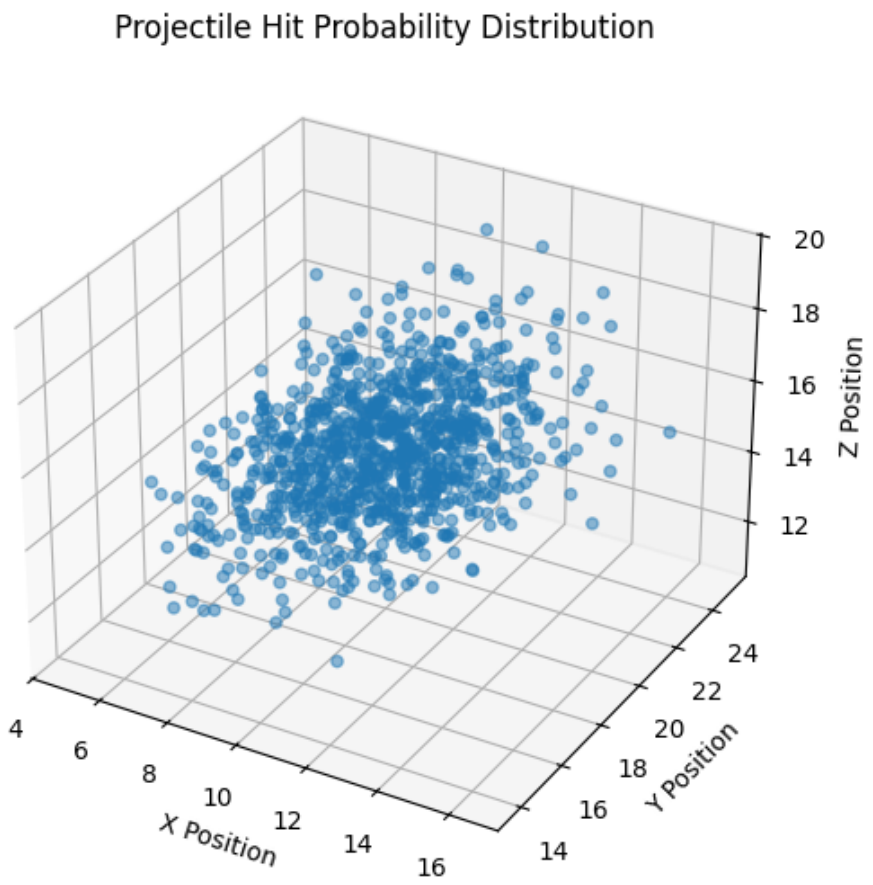

Experiment Code:

```
import numpy as np
import matplotlib.pyplot as plt
from scipy.stats import multivariate_normal

mean = [10, 20, 15]
cov = [[4, 1, 1], [1, 3, 1], [1, 1, 2]]
x, y, z = np.random.multivariate_normal(mean, cov, 1000).T

fig = plt.figure(figsize=(8, 6))
ax = fig.add_subplot(111, projection='3d')
ax.scatter(x, y, z, alpha=0.5)
ax.set_xlabel("X Position")
ax.set_ylabel("Y Position")
ax.set_zlabel("Z Position")
ax.set_title("Projectile Hit Probability Distribution")
```

```
plt.show()
```