Analyzed Data Using the Step-by-Step Calibration

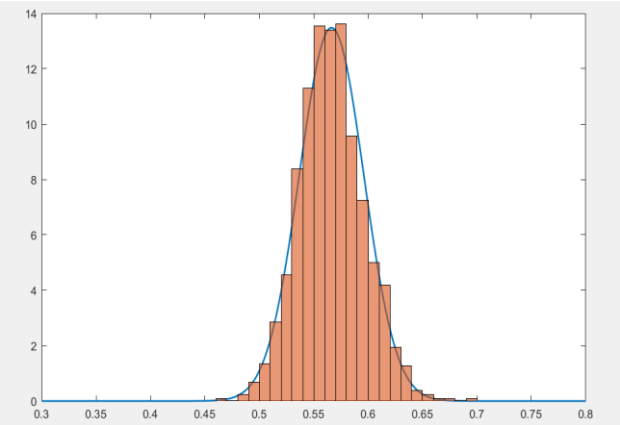
Test #1

Liquid Rate: 0.85 m/s

Gas Rate: 1.4623 m/s

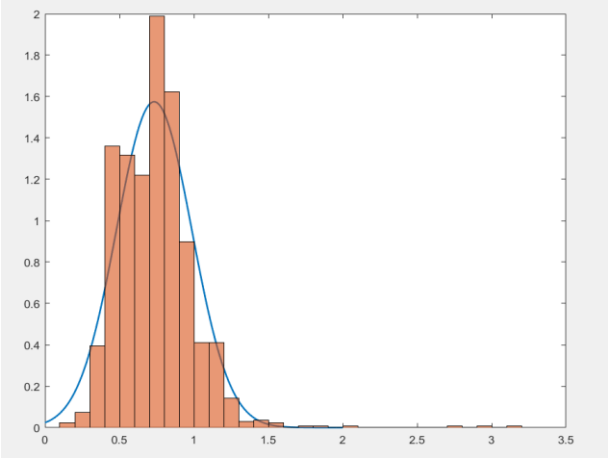
Slug liquid holdup:

```
Normal distribution
     mu = 0.566398    [0.56481, 0.567986]
  sigma = 0.029596    [0.0285152, 0.0307625]
```



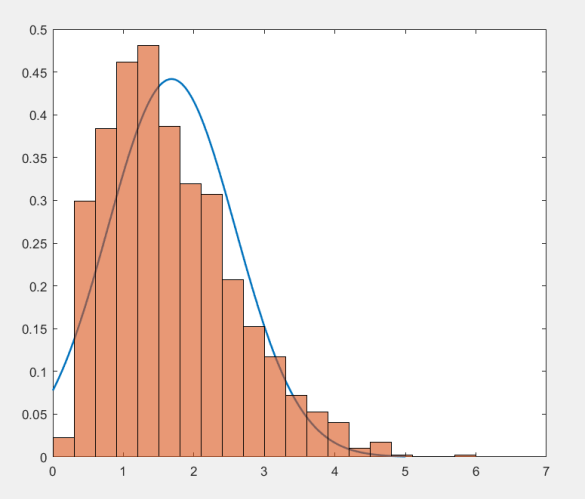
Slug Length:

```
Normal distribution
     mu = 0.733148    [0.719558, 0.746737]
  sigma = 0.253301    [0.244051, 0.263285]
```



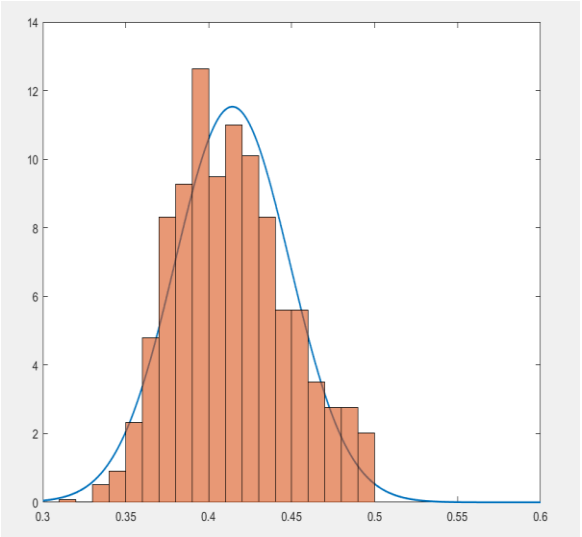
Film Length:

```
Normal distribution
     mu =   1.68339    [1.63494, 1.73184]
  sigma = 0.903048    [0.870071, 0.938643]
```



Film liquid hold up:

```
Normal distribution
     mu =   0.414211    [0.412355, 0.416068]
  sigma = 0.0346036    [0.0333399, 0.0359675]
```



Upper Limit: 0.65

Lower Limit: 0.5

Theoretical value for HLLS: 0.79815

Frequency: 76.87

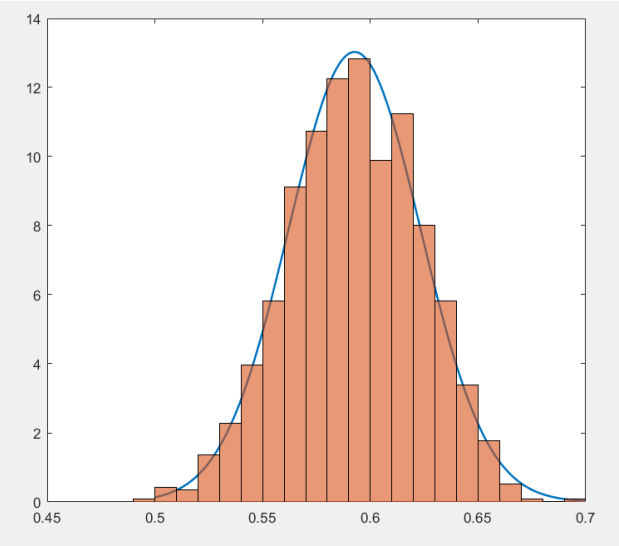
VTB: 3.081 m/s

Test #2

Liquid Rate: 0.85 m/s

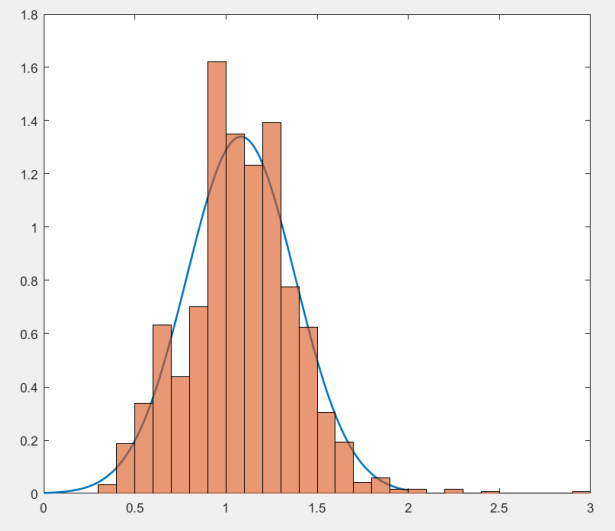
Gas Rate: 1.806 m/s

Slug liquid holdup:




```
Normal distribution
      mu =  0.592688    [0.590942, 0.594434]
   sigma = 0.0306166    [0.0294312, 0.0319023]
```

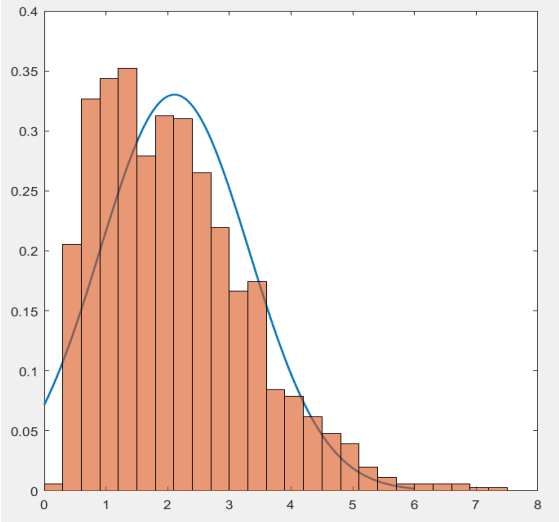
Slug Length:




```
Normal distribution
      mu =  1.08219    [1.06522, 1.09916]
   sigma = 0.297675    [0.28615, 0.310175]
```

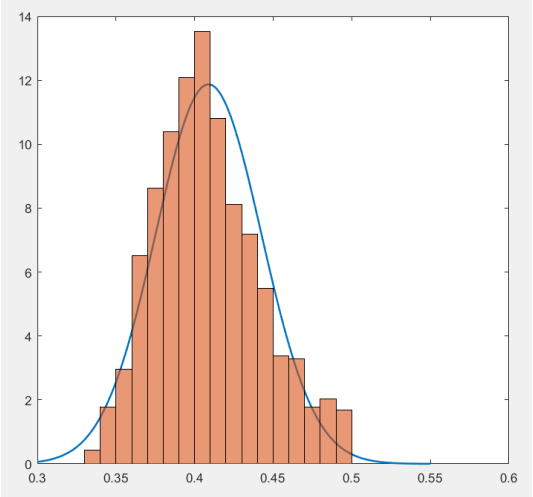
Film Length:

```
Normal distribution
      mu = 2.11069    [2.04178, 2.1796]
   sigma =  1.2081    [1.16131, 1.25885]
```



Film liquid holdup:

```
Normal distribution
      mu =  0.408862    [0.406946, 0.410778]
   sigma = 0.0336092    [0.032308, 0.0350206]
```



Upper Limit: 0.7

Lower Limit: 0.5

Theoretical value for HLLS: 0.773

Frequency: 68.07

VTB: 3.604 m/s

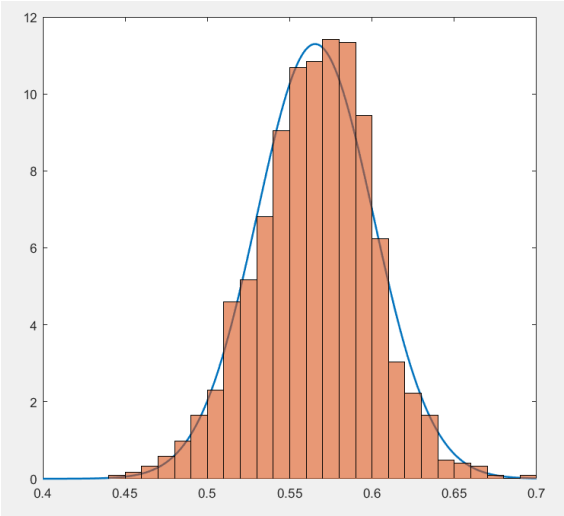
Test #3

Liquid Rate: 0.85 m/s

Gas Rate: 2.227 m/s

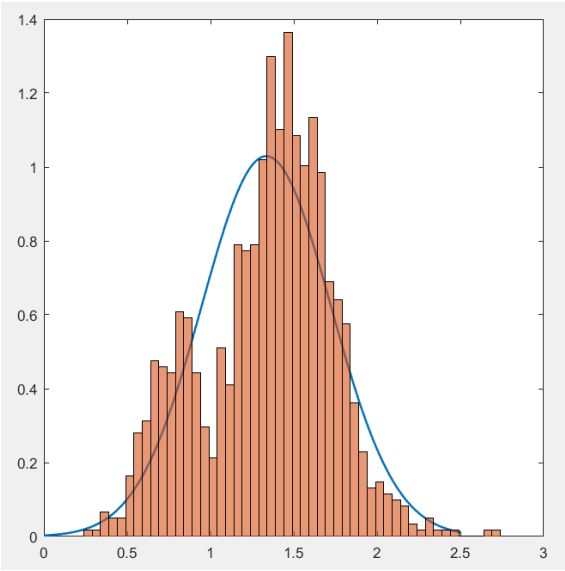
Slug liquid holdup:

```
Normal distribution
     mu =  0.565438    [0.563452, 0.567424]
  sigma = 0.0353159    [0.0339665, 0.0367778]
```



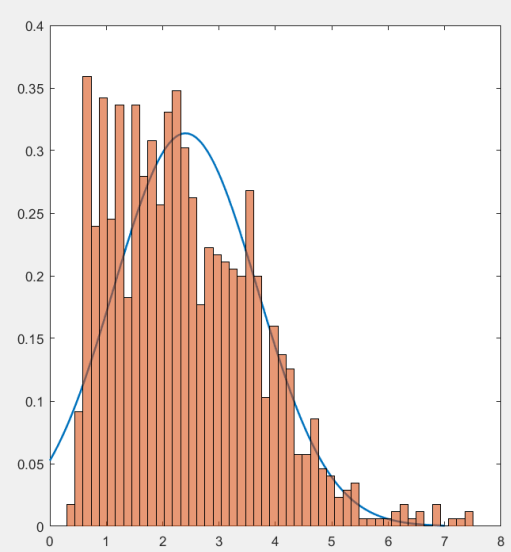
Slug Length:

```
Normal distribution
     mu =  1.33476    [1.31296, 1.35656]
  sigma = 0.387608    [0.372798, 0.403653]
```



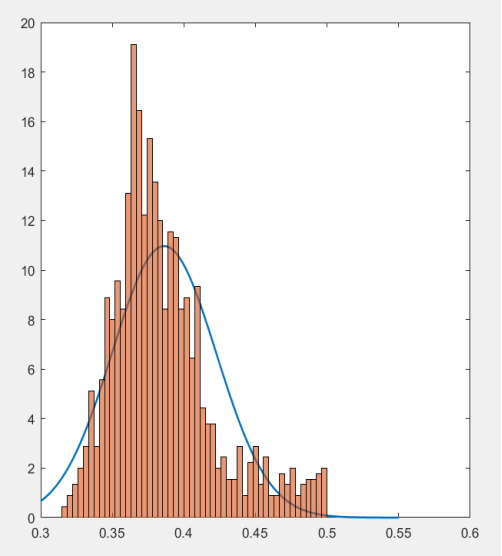
Film length:

```
Normal distribution
     mu = 2.40426    [2.33275, 2.47576]
  sigma = 1.27144    [1.22286, 1.32407]
```



Film liquid holdup:

```
Normal distribution
     mu =  0.386155    [0.384109, 0.388201]
  sigma = 0.0363732    [0.0349834, 0.0378788]
```



Upper Limit: 0.65

Lower Limit: 0.5

Theoretical value for slug liquid holdup: 0.742692

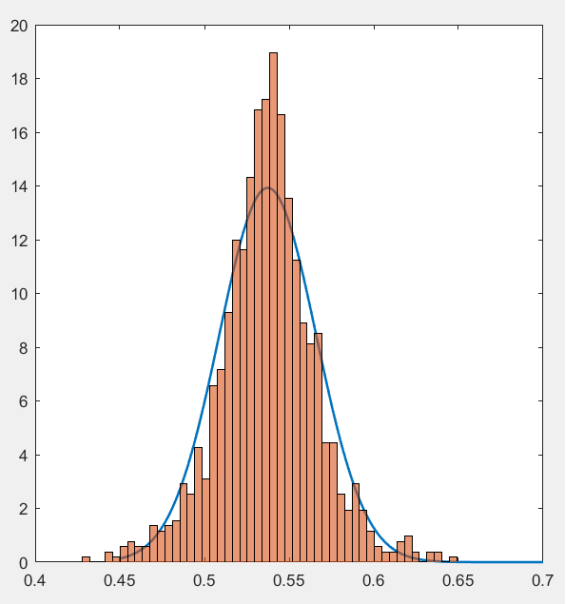
Frequency: 69.974

VTB: 4.34 m/s

Test #4

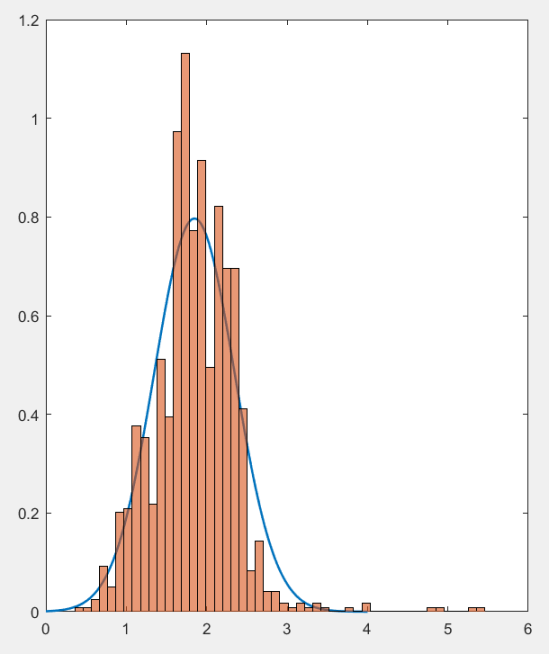
Liquid Rate: 0.85 m/s

Gas Rate: 2.83 m/s



Slug liquid holdup:

```
Normal distribution
     mu =  0.537343   [0.535699, 0.538987]
  sigma = 0.0286445   [0.0275286, 0.0298553]
```

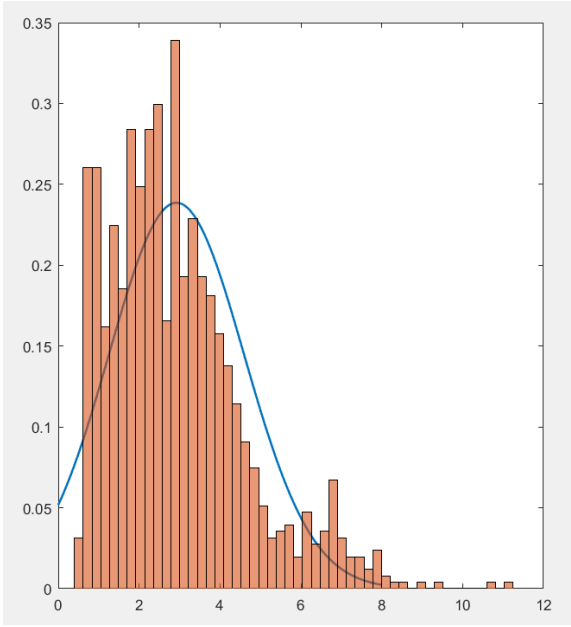


Slug liquid holdup:

```
Normal distribution
     mu =  1.84717   [1.81844, 1.8759]
  sigma = 0.500655   [0.481151, 0.521818]
```

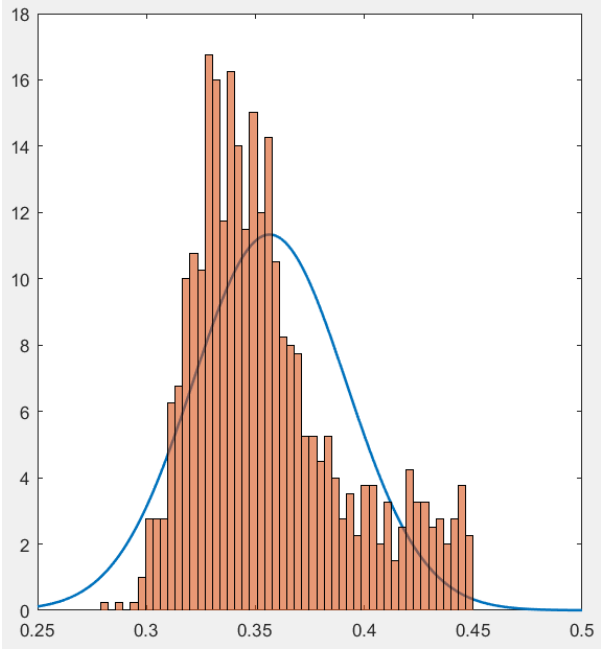
Film length:

```
Normal distribution
      mu = 2.92336    [2.82741, 3.01931]
   sigma =   1.672    [1.60687, 1.74268]
```



Film liquid holdup:

```
Normal distribution
      mu =  0.356505    [0.354485, 0.358525]
   sigma = 0.0352012    [0.0338299, 0.0366892]
```



Upper Limit: 0.65

Lower Limit: 0.45

Theoretical value for slug liquid holdup: 0.70

Frequency: 67.272

VTB: 5.32 m/s

The following section is the summary of results for the case of $V_{sl} = 0.85 \frac{m}{s}$

Gas Rate	HLLS	HLLS Theory	Ls	VTB	HLTB	Freq
1.4623	0.566	0.79815	0.733	3.08	0.414	76.87369
1.8065	0.593	0.772709	1.082	3.6	0.4088	68
2.2275	0.595438	0.742692	1.33476	4.33	0.386	69.97403
2.83	0.5373	0.701752	1.847	5.32	0.3565	67.27166