Eigen-Dev

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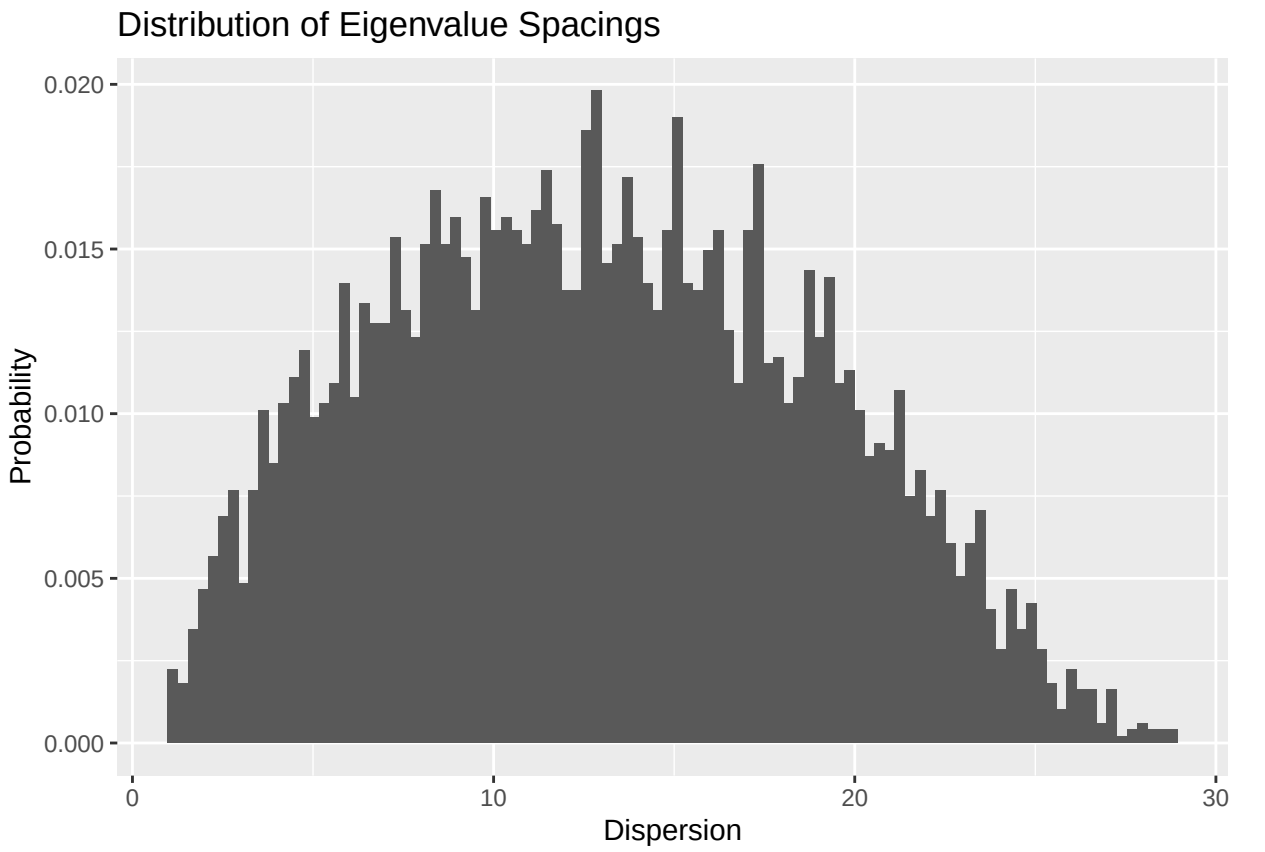
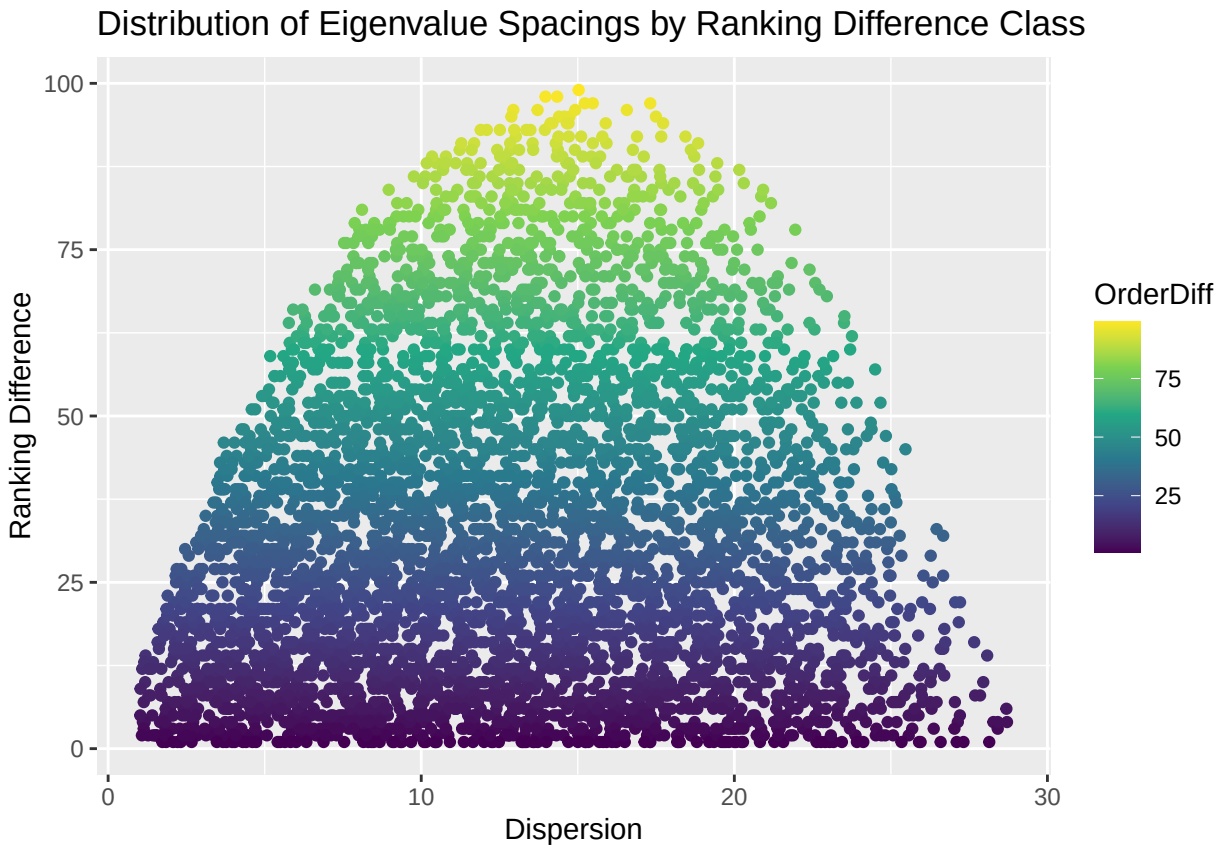
2/23/2021

Standard Normal, Different Norms (Standard and Power-4)

```
P <- RM_norm(100, cplx = T)
P %>% dispersion.histogram()
```

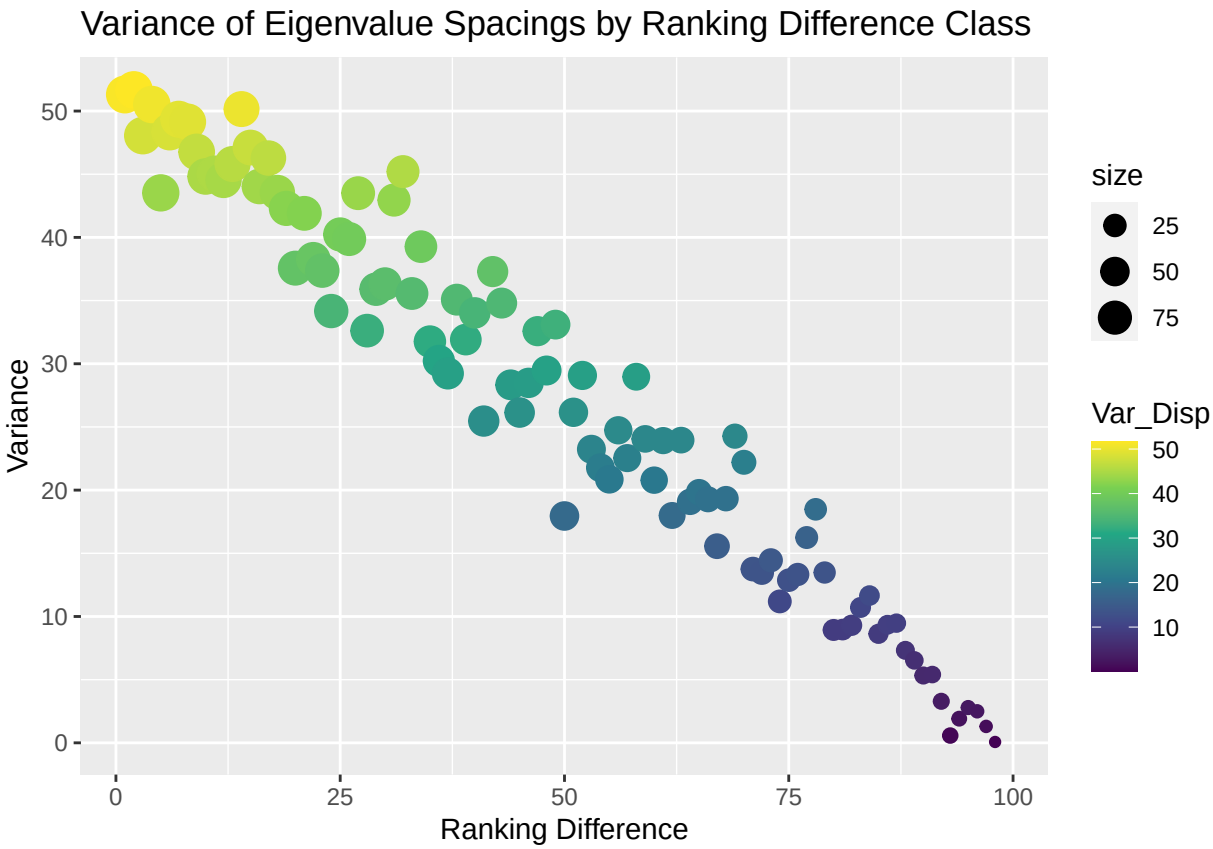



```
P %>% dispersion.scatterplot()
```



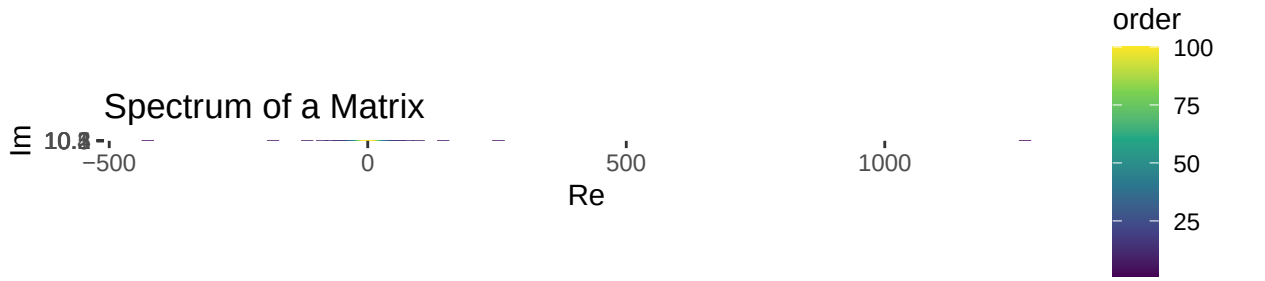

```
P %>% dispersion.varplot()
```

```
## Warning: Removed 1 rows containing missing values (geom_point).
```

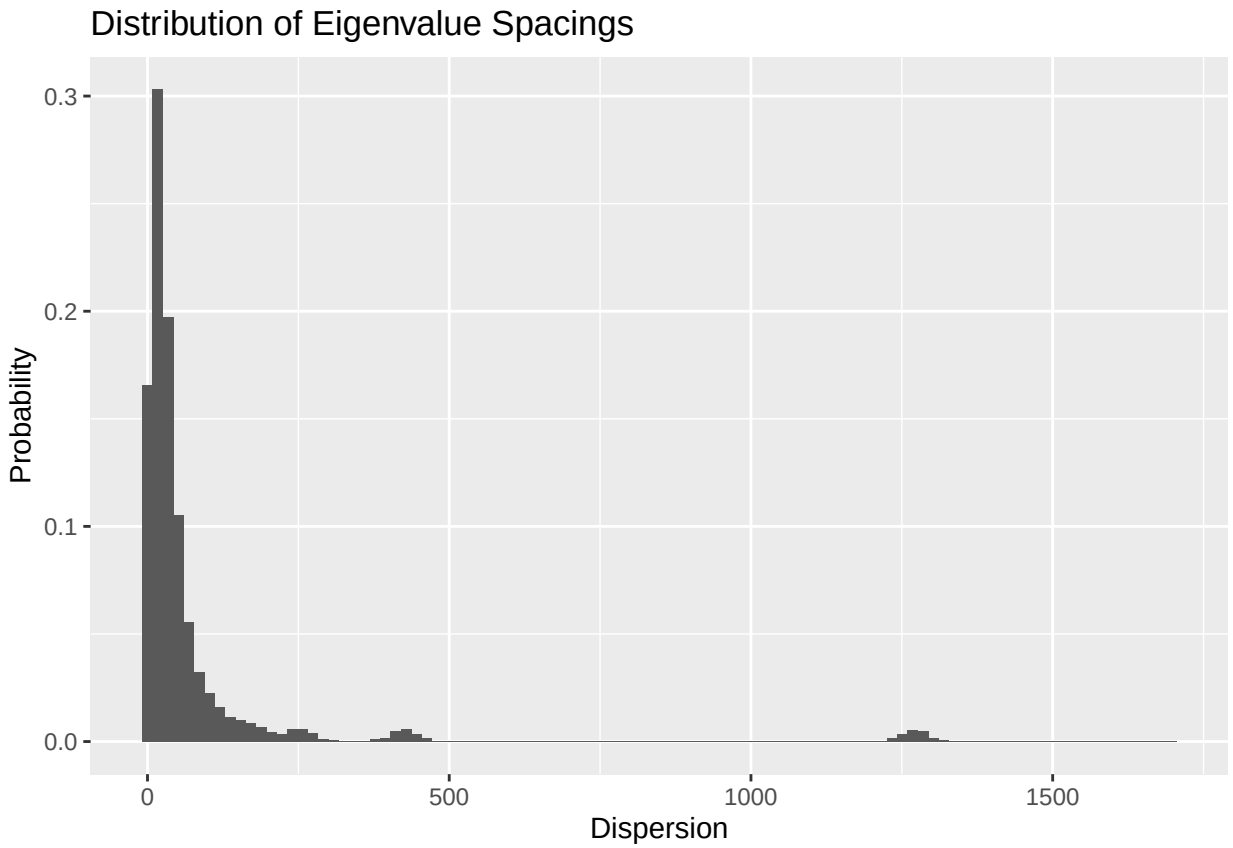

Variance of Eigenvalue Spacings by Ranking Difference Class
Variance
Ranking Difference
0
10
20
30
40
50
0
25
50
75
100
size
25
50
75
Var_Disp
50
40
30
20
10

100 x 100; N(10,1) Complex Hermitian

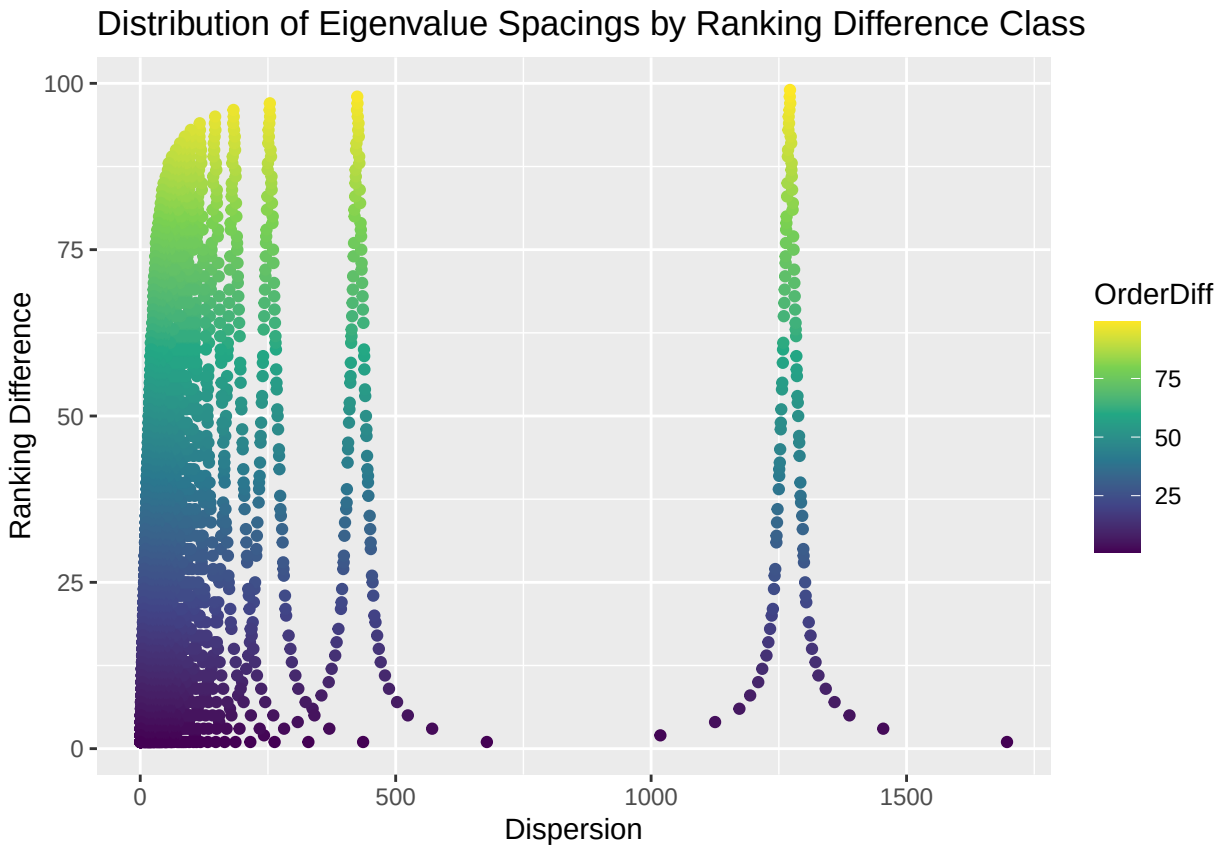
```
P <- RM_norm(100, mean = 10, cplx = T, herm = T)
P %>% spectrum.scatterplot()
```




```
P %>% dispersion.histogram()
```

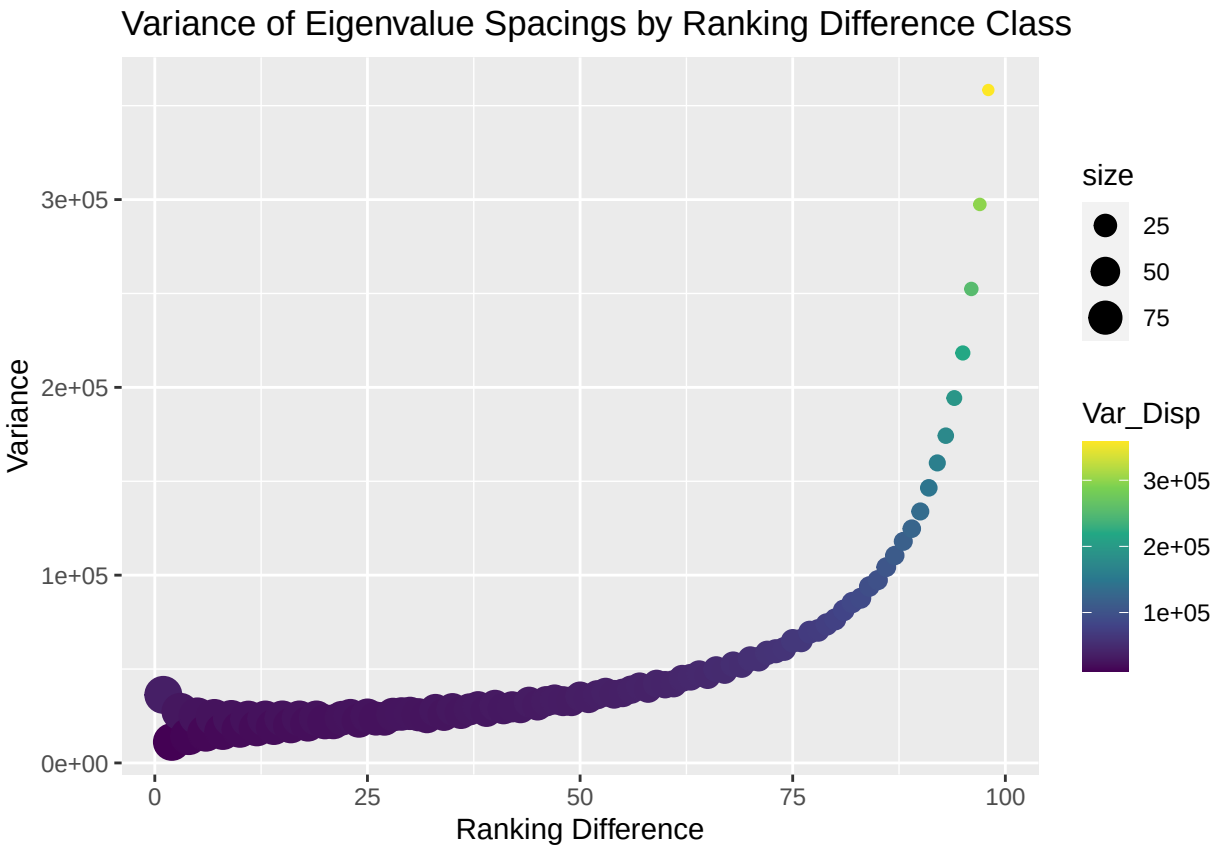



```
P %>% dispersion.scatterplot()
```



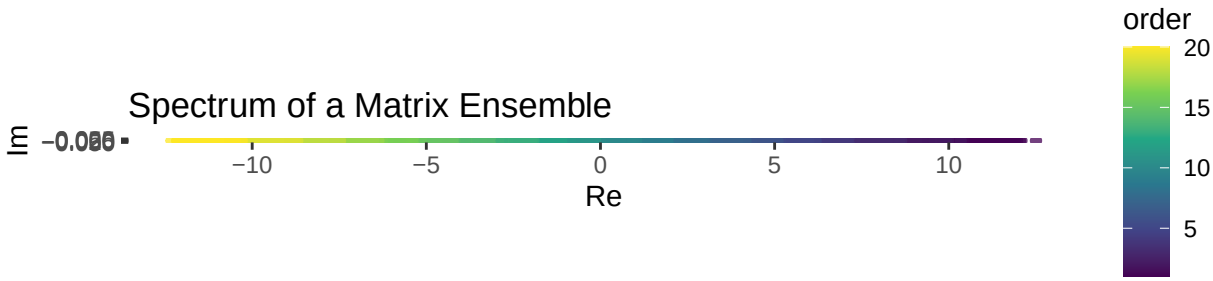

```
P %>% dispersion.varplot()
```

```
## Warning: Removed 1 rows containing missing values (geom_point).
```

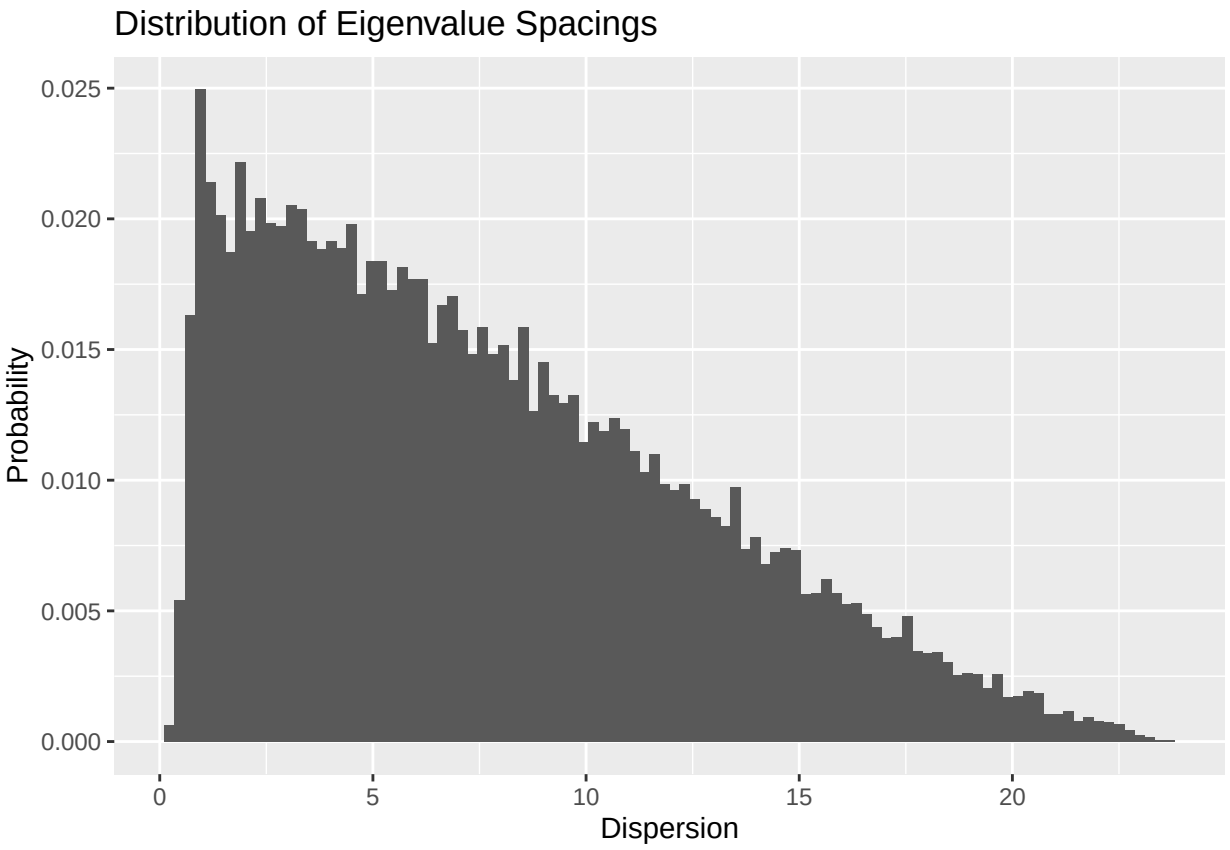

Variance of Eigenvalue Spacings by Ranking Difference Class
Variance
3e+05
2e+05
1e+05
0e+00
0
25
50
75
100
Ranking Difference
size
25
50
75
Var_Disp
3e+05
2e+05
1e+05

Beta = 4 (Standard Norm)

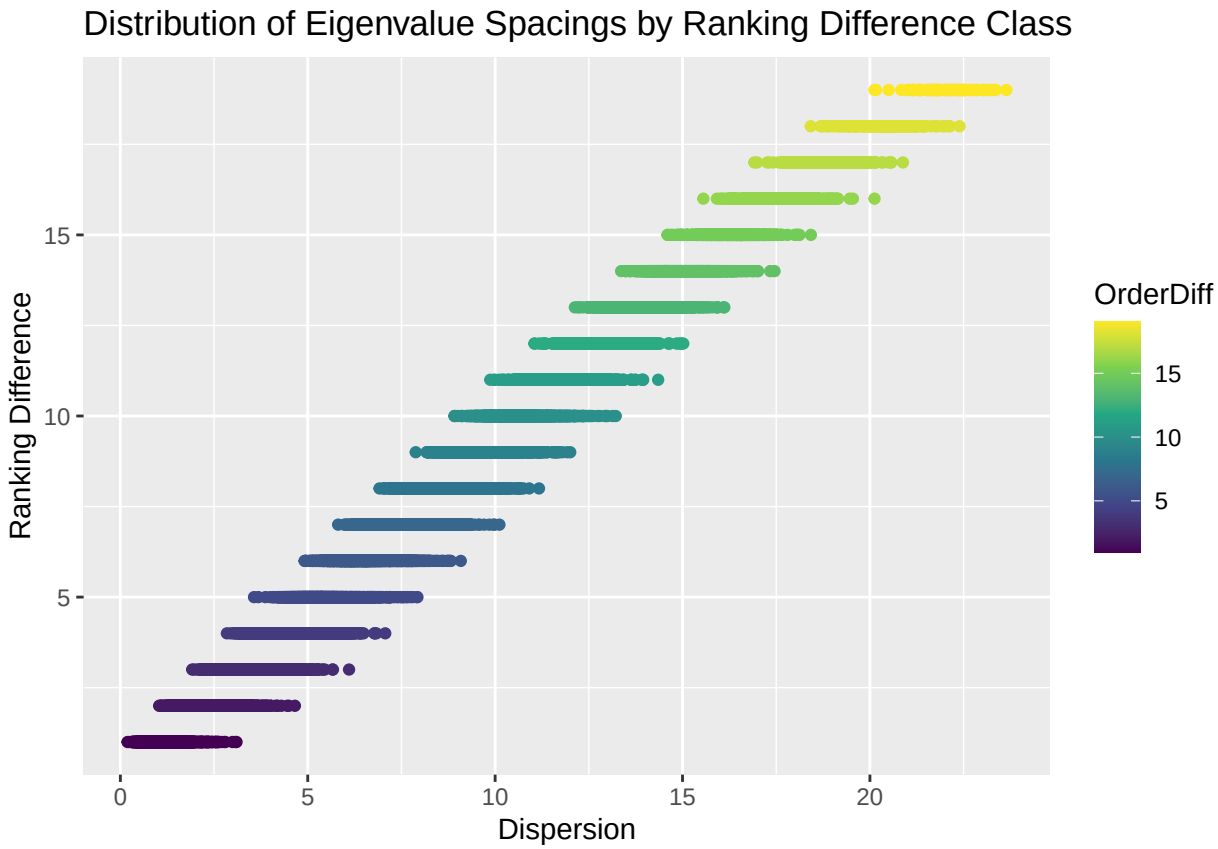
```
ens <- RME_beta(N = 20, beta = 4, size = 100)
ens %>% spectrum.scatterplot()
```



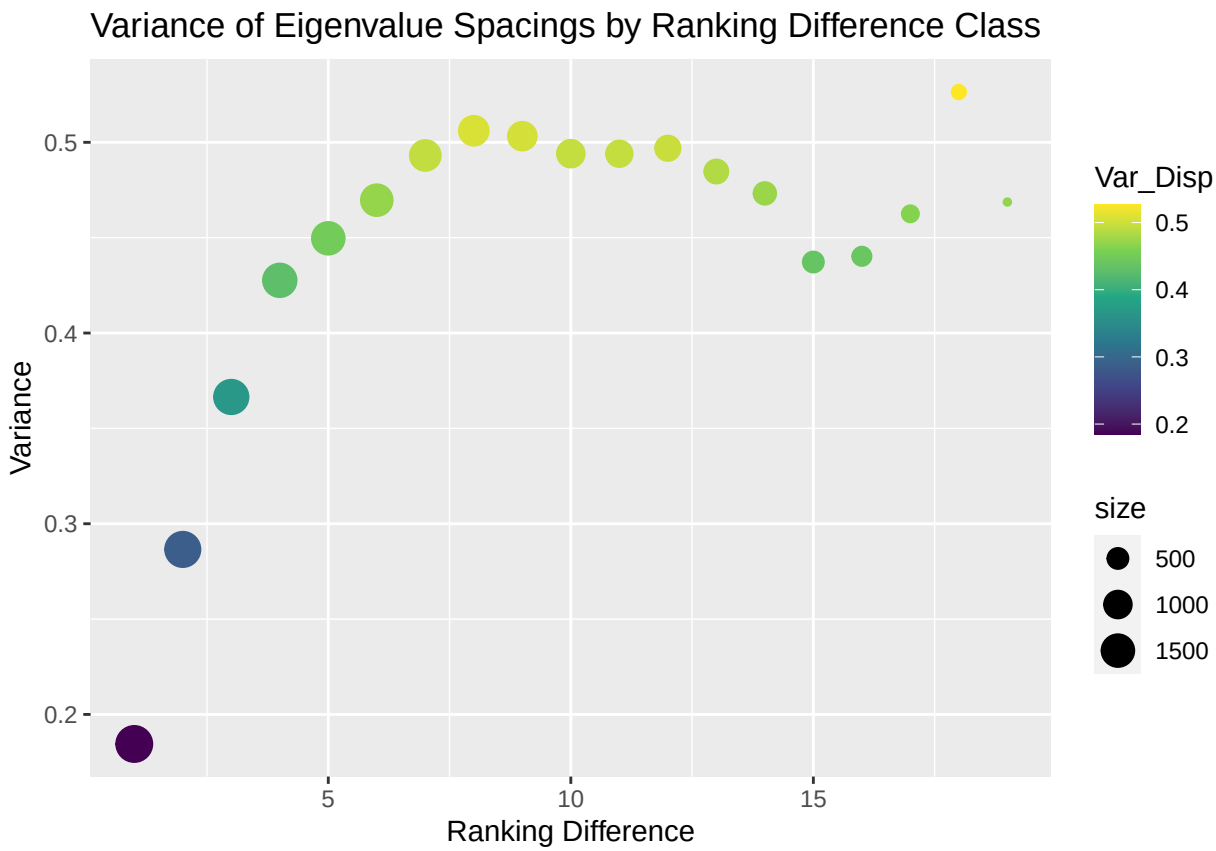

```
ens %>% dispersion.histogram()
```




```
ens %>% dispersion.scatterplot()
```

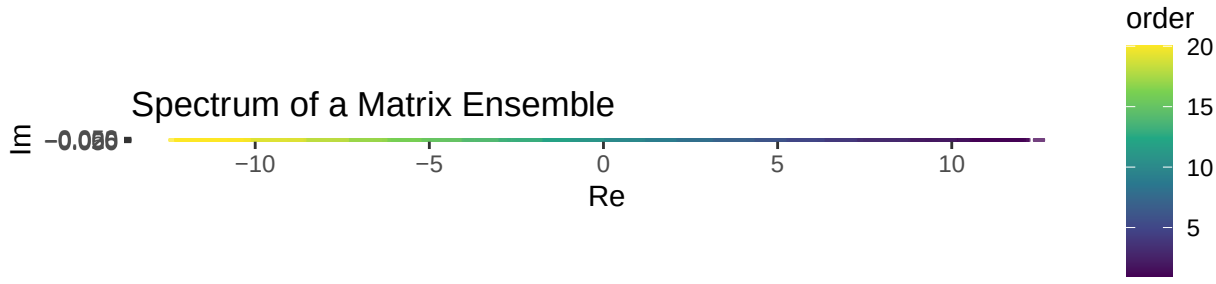



```
ens %>% dispersion.varplot()
```

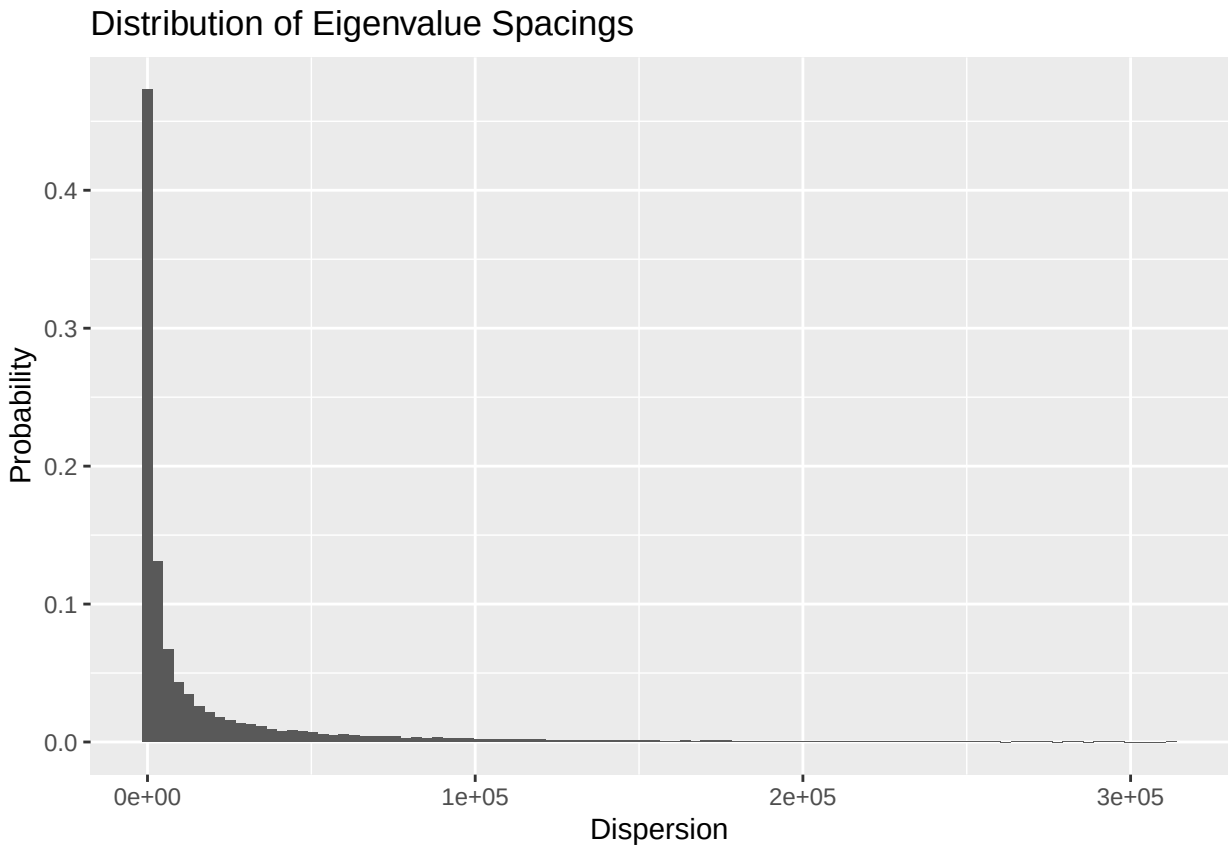


Beta = 4 (Power-4 Norm)

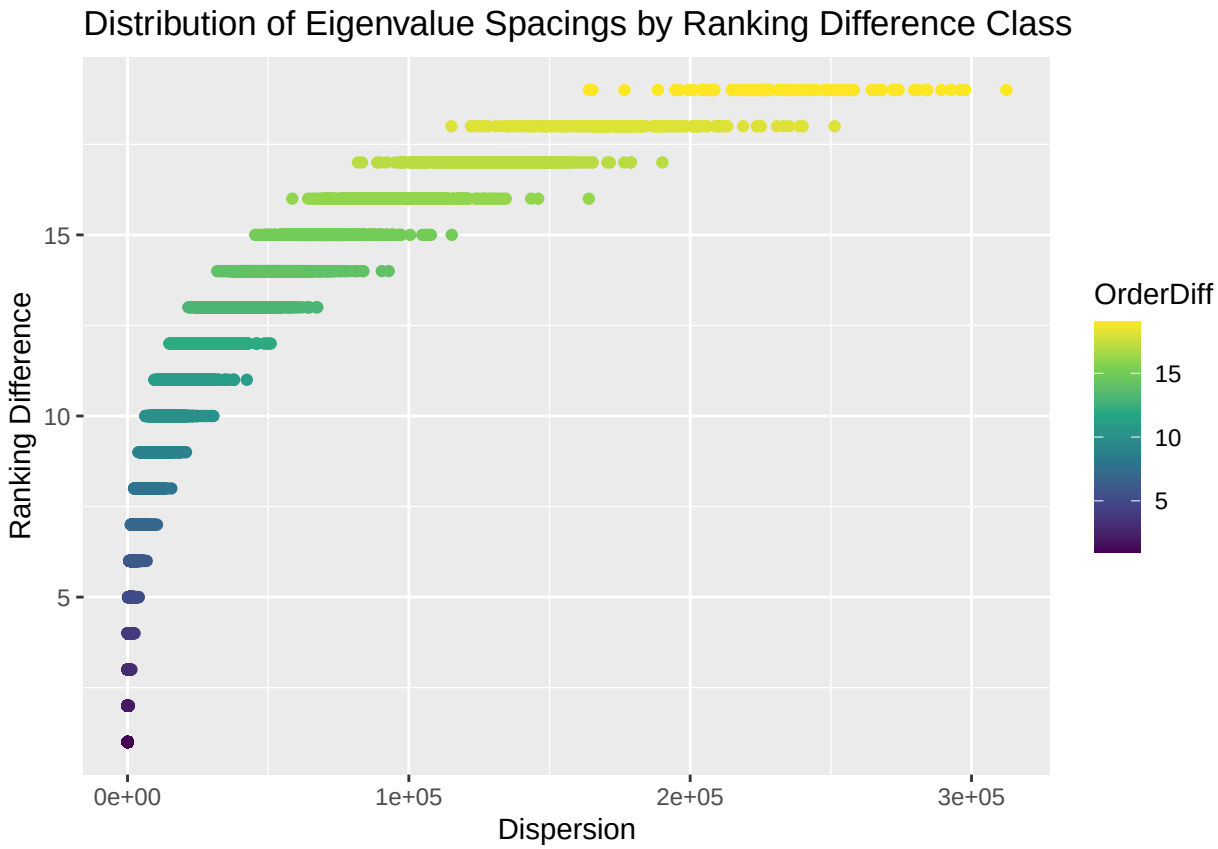
```
ens %>% spectrum.scatterplot()
```



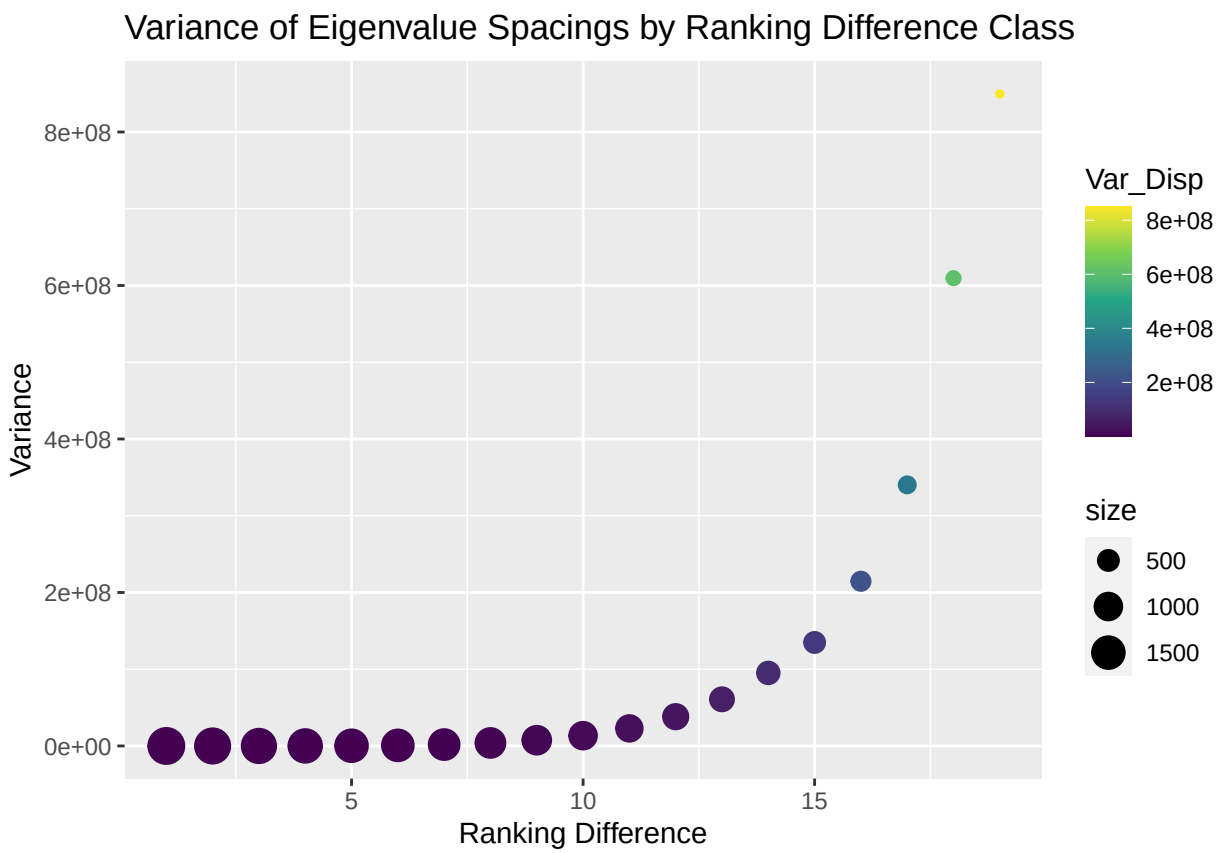

```
ens %>% dispersion.histogram(norm = 4)
```



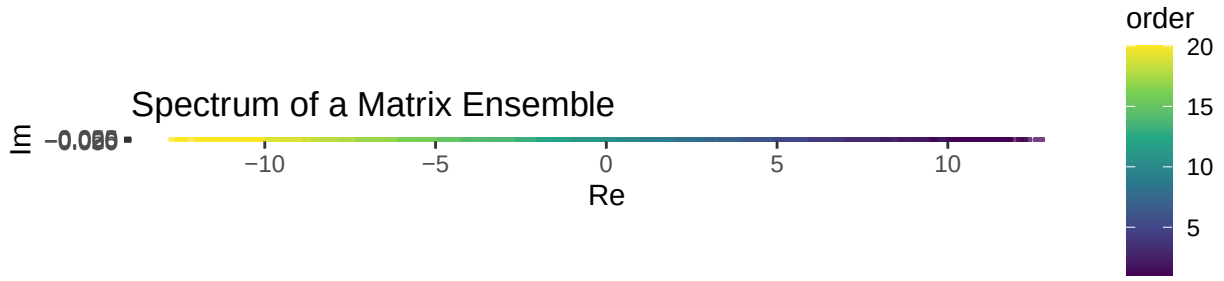

```
ens %>% dispersion.scatterplot(norm = 4)
```



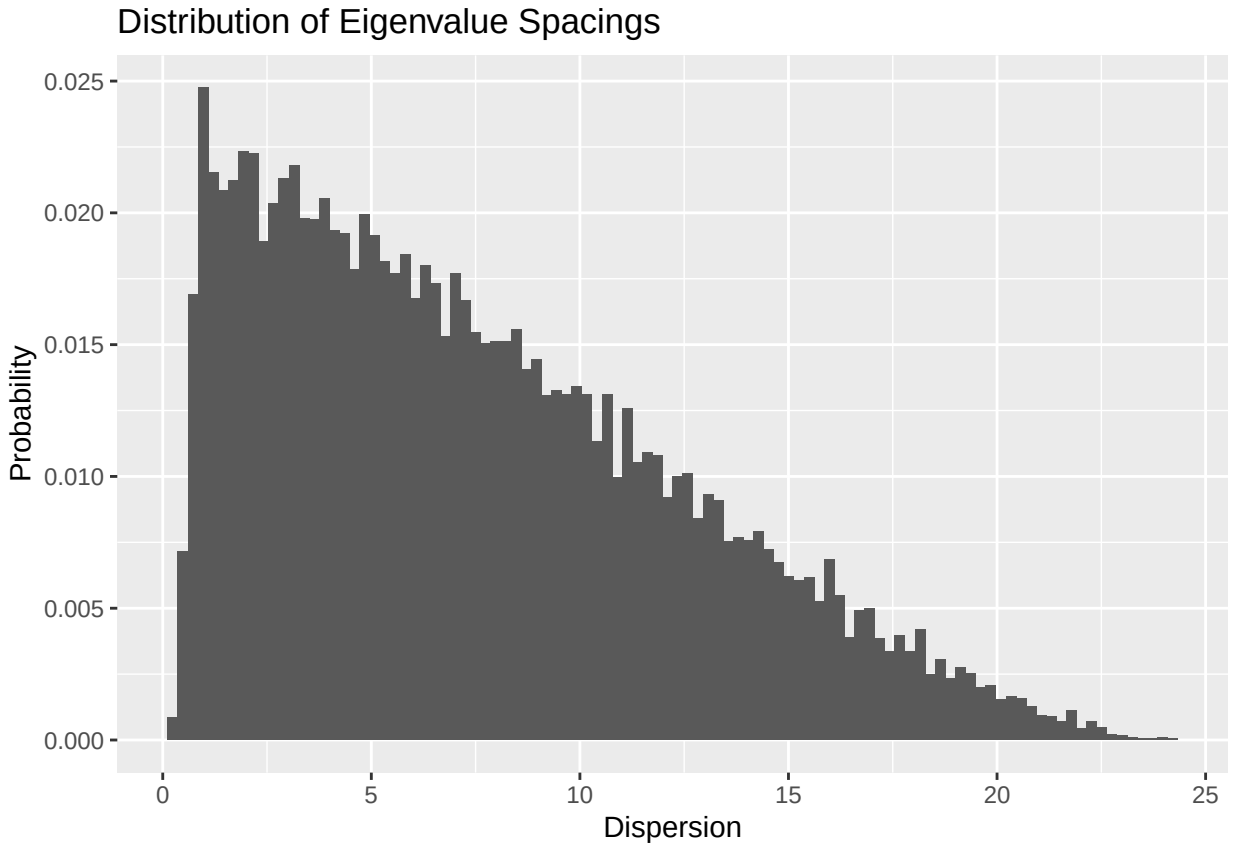

```
ens %>% dispersion.varplot(norm = 4)
```



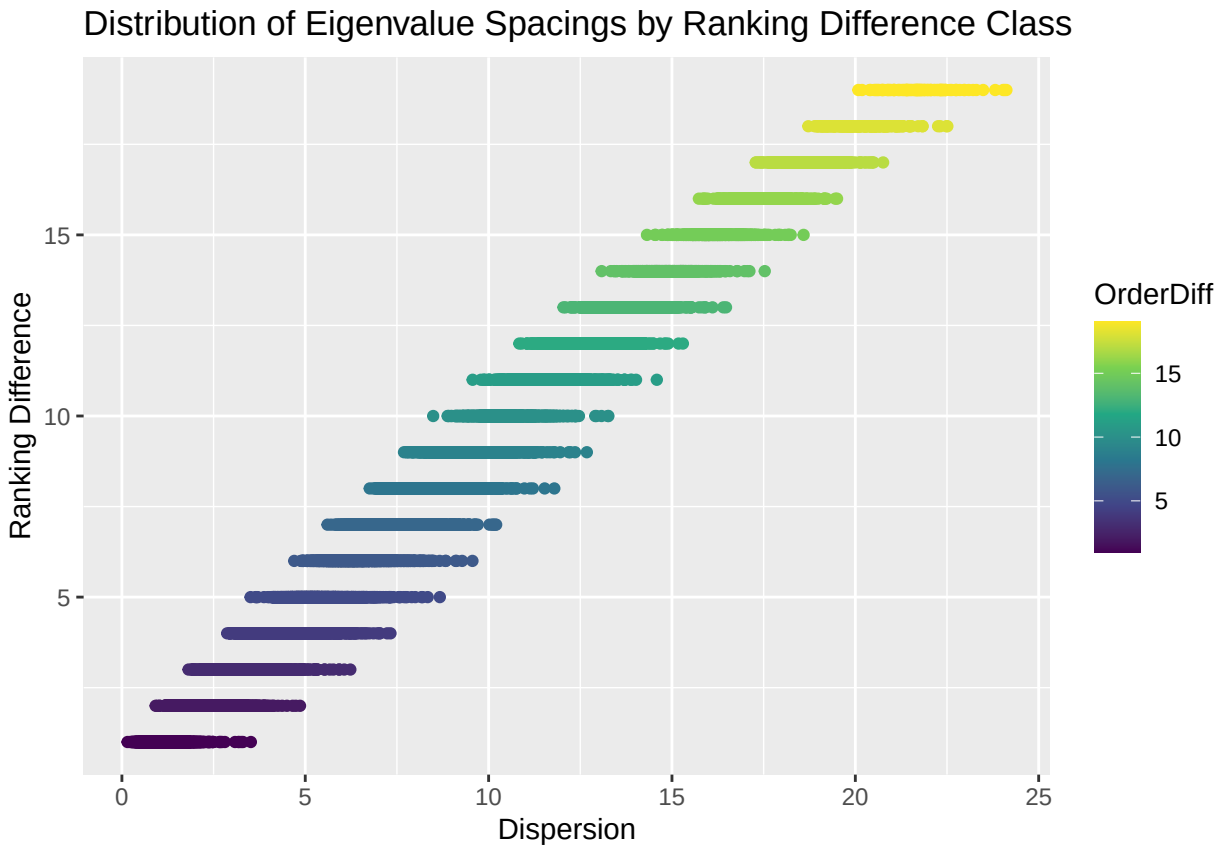

```
ens <- RME_beta(N = 20, beta = 4, size = 100)
ens %>% spectrum.scatterplot()
```



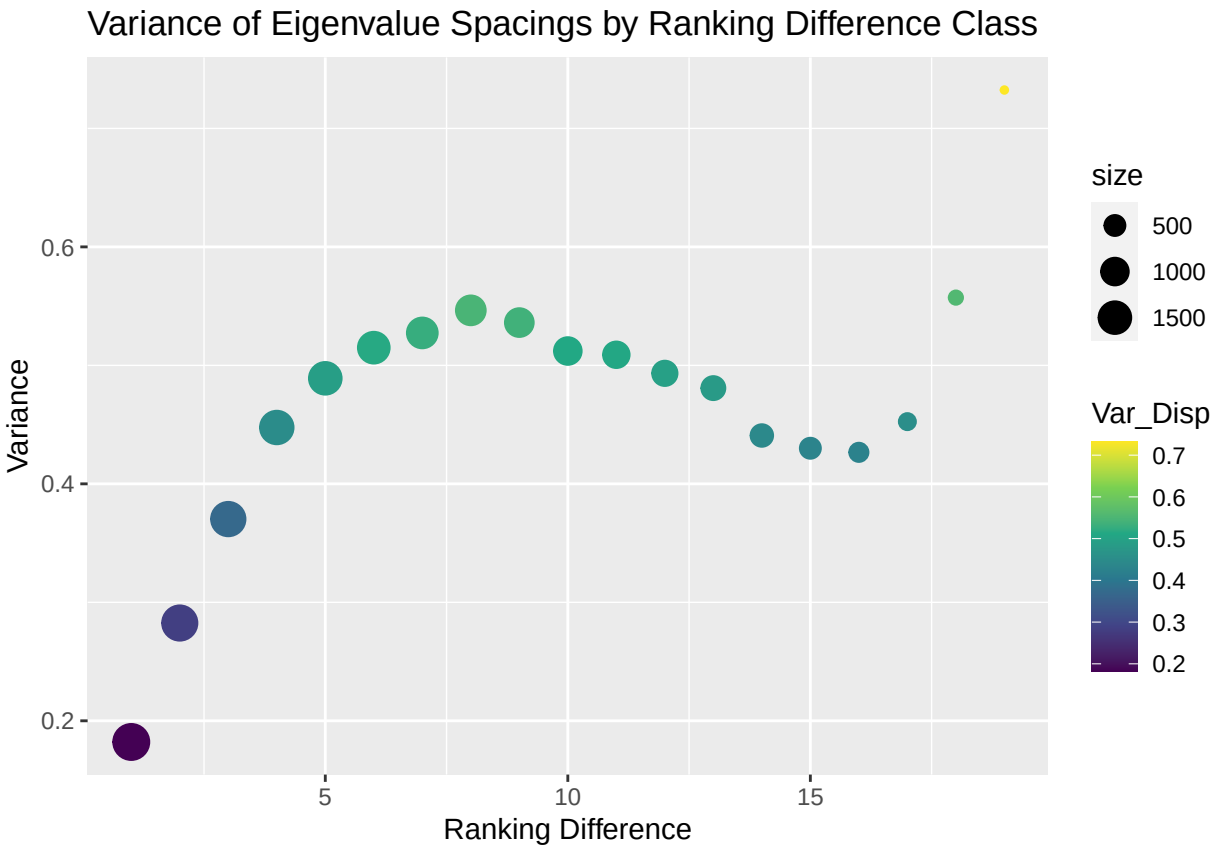

```
ens %>% dispersion.histogram()
```




```
ens %>% dispersion.scatterplot()
```




```
ens %>% dispersion.varplot()
```


Variance of Eigenvalue Spacings by Ranking Difference Class
Variance
0.6
0.4
0.2
5
10
15
Ranking Difference
size
500
1000
1500
Var_Disp
0.7
0.6
0.5
0.4
0.3
0.2