ML2

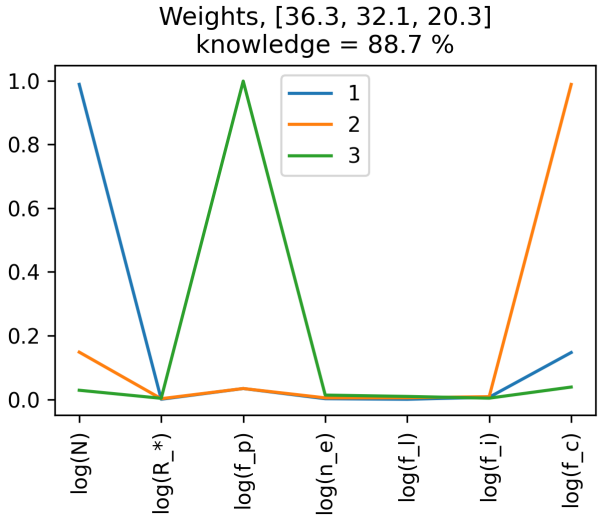
December 27, 2021

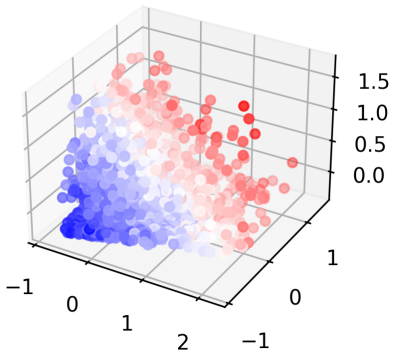
[1]:
```
from sklearn.decomposition import PCA
import numpy as np
import matplotlib.pyplot as plt
import pandas as pd
from mpl_toolkits.mplot3d import Axes3D
plt.rcParams['figure.facecolor'] = 'white'

data = pd.read_csv('collectedData/meti_tabela_csv.csv', index_col=0)
parameters = list(data.columns)[:-4]
parameters_nomath = [p.replace("_pm", "_{pm}").replace("_me", "_{me}") if "("␣
↪in p else p.replace("_", " ") for p in parameters]
data = np.load('collectedData/meti_parameters.npy')
labels = np.load('collectedData/meti_labels.npy')[:, 0]
columns = [[4, 6, 7, 9, 10, 11, 12], [4, 5, 8], [4, 6, 7, 9, 10, 11, 12], [6,␣
↪9, 13, 14, 15, 16, 17, 18]]
podatki = [(data[data[:, 0] == 1, :][:, columns[0]], [parameters[c] for c in␣
↪columns[0]], labels[data[:, 0] == 1], 'Model Drake')]
podatki += [(data[data[:, 1] == 1, :][:, columns[1]], [parameters[c] for c in␣
↪columns[1]], labels[data[:, 1] == 1], 'Model Simplified')]
podatki += [(data[data[:, 2] == 1, :][:, columns[2]], [parameters[c] for c in␣
↪columns[2]], labels[data[:, 2] == 1], 'Model Expand')]
podatki += [(data[data[:, 3] == 1, :][:, columns[3]], [parameters[c] for c in␣
↪columns[3]], labels[data[:, 3] == 1], 'Model Rare Earth')]
```

[3]:
```
for d, p, l, m in podatki:
    pca = PCA().fit(d)
    data = pca.transform(d)
    plt.figure(figsize=(8, 4), dpi=300, tight_layout=True), plt.suptitle(m)
    plt.subplot(121)
    plt.plot(np.abs(pca.components_.T[:, 0]), label="1")
    plt.plot(np.abs(pca.components_.T[:, 1]), label="2")
    plt.plot(np.abs(pca.components_.T[:, 2]), label="3")
    plt.xticks(list(range(len(p))), p, rotation=90)
    plt.title(f"Weights, {list(np.round(pca.explained_variance_[:3] / np.
↪sum(pca.explained_variance_) * 100, 1))}"
              f"\nknowledge = {(np.sum(pca.explained_variance_[:3]) / np.
↪sum(pca.explained_variance_)) * 100:.1f} %")
```

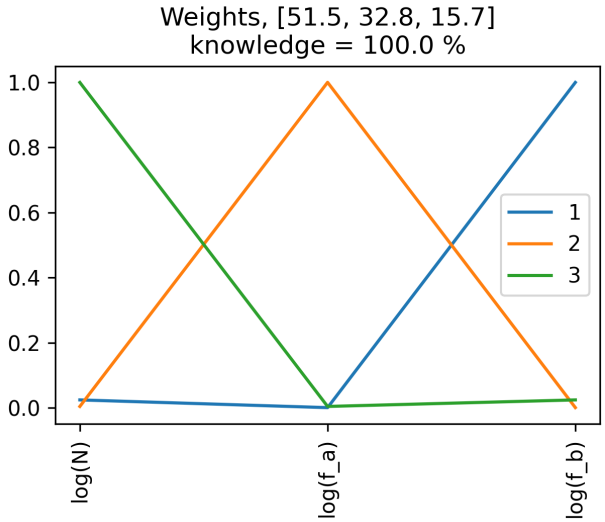
```
    plt.legend(loc="best")
    ax = plt.subplot(122, projection='3d')
    ax.scatter(data[:, 0], data[:, 1], data[:, 2], c=l, cmap="bwr")
plt.show()
```

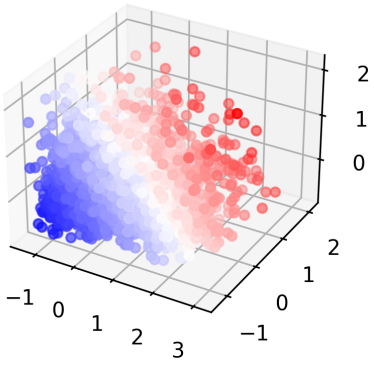
Model Drake



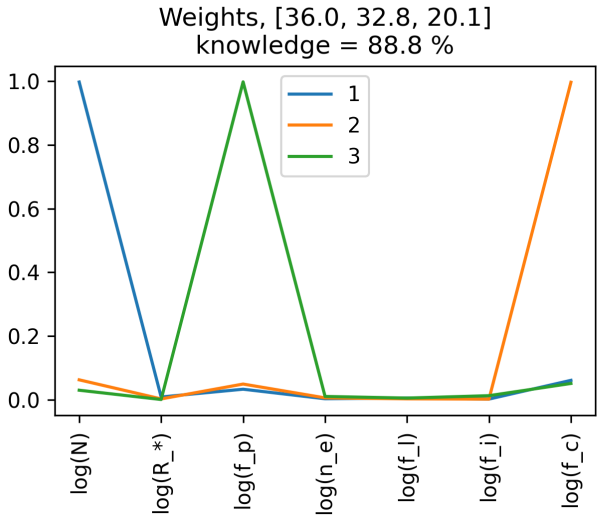


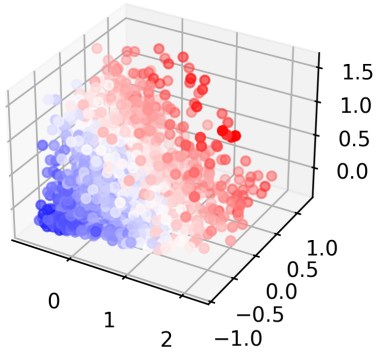
Model Simplified



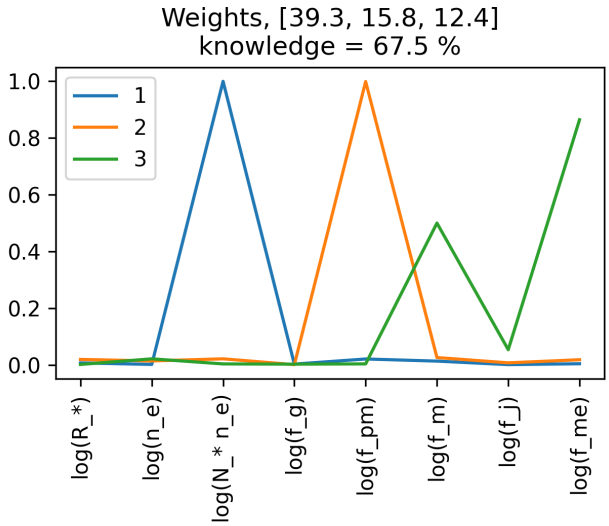


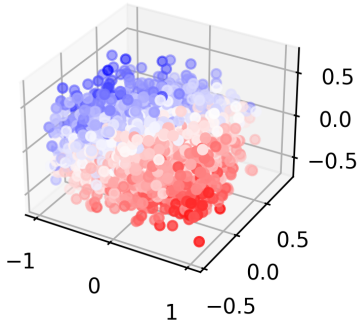
Model Expand





Model Rare Earth





1 Rules

1.1 Model I

L:

- $(N \leq 14.0) \wedge (f_c > 18.0\ \%) \wedge (f_p > 40.0\ \%) \wedge (N > 4.0) \Rightarrow L = 7.7$, Size=12 %, Impurity=0.143

- $(f_c \leq 18.0\ \%) \wedge (N \leq 11.0) \wedge (f_p > 40.0\ \%) \wedge (f_c \leq 4.0\ \%) \Rightarrow L = 64.6,$ Size=11 %, Impurity=0.186
- $(N \leq 11.0) \wedge (f_c > 18.0\ \%) \wedge (f_p > 60.0\ \%) \wedge (N \leq 4.0) \Rightarrow L = 2.5,$ Size=18 %, Impurity=0.148
- $(N \leq 14.0) \wedge (f_c > 18.0\ \%) \wedge (f_p > 40.0\ \%) \wedge (N \leq 4.0) \Rightarrow L = 2.2,$ Size=15 %, Impurity=0.166
- $(N \leq 14.0) \wedge (f_c \leq 18.0\ \%) \wedge (f_p > 28.0\ \%) \wedge (f_c > 6.0\ \%) \Rightarrow L = 17.3,$ Size=20 %, Impurity=0.173
- $(f_c \leq 18.0\ \%) \wedge (N \leq 11.0) \wedge (f_p > 28.0\ \%) \wedge (f_c > 7.0\ \%) \Rightarrow L = 14.5,$ Size=15 %, Impurity=0.176
- $(f_c > 14.0\ \%) \wedge (N \leq 14.0) \wedge (f_p > 40.0\ \%) \wedge (N \leq 4.0) \Rightarrow L = 2.6,$ Size=17 %, Impurity=0.164
- $(f_c > 18.0\ \%) \wedge (N \leq 14.0) \wedge (f_p > 40.0\ \%) \wedge (N > 4.0) \Rightarrow L = 7.6,$ Size=12 %, Impurity=0.138
- $(f_c \leq 14.0\ \%) \wedge (N \leq 14.0) \wedge (f_p > 40.0\ \%) \wedge (f_c \leq 4.0\ \%) \Rightarrow L = 73.6,$ Size=9 %, Impurity=0.199
- $(f_c > 18.0\ \%) \wedge (N \leq 14.0) \wedge (f_p > 60.0\ \%) \wedge (N \leq 4.0) \Rightarrow L = 2.8,$ Size=19 %, Impurity=0.142
- $(N \leq 11.0) \wedge (f_c \leq 9.0\ \%) \wedge (f_p > 70.0\ \%) \wedge (f_c > 4.0\ \%) \Rightarrow L = 26.2,$ Size=12 %, Impurity=0.137
- $(f_c > 11.0\ \%) \wedge (N \leq 14.0) \wedge (f_p > 28.0\ \%) \wedge (N > 4.0) \Rightarrow L = 10.1,$ Size=14 %, Impurity=0.184
- $(f_c > 9.0\ \%) \wedge (N \leq 14.0) \wedge (f_p > 28.0\ \%) \wedge (f_c \leq 22.0\ \%) \Rightarrow L = 13.0,$ Size=17 %, Impurity=0.173
- $(f_c > 9.0\ \%) \wedge (N \leq 14.0) \wedge (f_p > 28.0\ \%) \wedge (f_c \leq 22.0\ \%) \Rightarrow L = 12.1,$ Size=18 %, Impurity=0.168
- $(f_c \leq 18.0\ \%) \wedge (N \leq 11.0) \wedge (f_p > 28.0\ \%) \wedge (N \leq 4.0) \Rightarrow L = 16.2,$ Size=18 %, Impurity=0.181
- $(f_c > 18.0\ \%) \wedge (N \leq 14.0) \wedge (f_p > 40.0\ \%) \Rightarrow L = 3.7,$ Size=30 %, Impurity=0.186
- $(f_c \leq 18.0\ \%) \wedge (N \leq 14.0) \wedge (f_p > 40.0\ \%) \wedge (f_c \leq 4.0\ \%) \Rightarrow L = 73.1,$ Size=8 %, Impurity=0.181
- $(f_c \leq 18.0\ \%) \wedge (N \leq 11.0) \wedge (f_p > 60.0\ \%) \wedge (f_c \leq 6.0\ \%) \Rightarrow L = 51.4,$ Size=14 %, Impurity=0.19
- $(f_c \leq 9.0\ \%) \wedge (N \leq 9.0) \wedge (f_p > 60.0\ \%) \wedge (N > 4.0) \Rightarrow L = 63.0,$Size=8 %, Impurity=0.105
- $(N \leq 14.0) \wedge (f_c > 18.0\ \%) \wedge (f_p > 40.0\ \%) \Rightarrow L = 3.7,$ Size=30 %, Impurity=0.196
- $(N \leq 11.0) \wedge (f_c > 18.0\ \%) \wedge (f_p > 60.0\ \%) \wedge (N > 4.0) \Rightarrow L = 7.8,$ Size=10 %, Impurity=0.122

- $(N \leq 11.0) \wedge (f_c > 18.0\ \%) \wedge (f_p > 60.0\ \%) \wedge (N > 4.0) \Rightarrow L = 8.0$, Size=10 %, Impurity=0.15
- $(f_c > 9.0\ \%) \wedge (N \leq 14.0) \wedge (f_p > 28.0\ \%) \wedge (f_c \leq 28.0\ \%) \Rightarrow L = 10.7$, Size=23 %, Impurity=0.176
- $(N \leq 14.0) \wedge (f_c > 18.0\ \%) \wedge (f_p > 40.0\ \%) \wedge (N > 4.0) \Rightarrow L = 7.6$, Size=12 %, Impurity=0.151
- $(f_c > 18.0\ \%) \wedge (N \leq 14.0) \wedge (f_p > 40.0\ \%) \wedge (N \leq 4.0) \Rightarrow L = 2.6$, Size=19 %, Impurity=0.156

1.2 Model I

P(L < 1000):

- $(N \leq 40.0) \wedge (f_p > 11.0\ \%) \wedge (N \leq 14.0) \wedge (f_p > 40.0\ \%) \Rightarrow P(L < 1000) = 100.0\ \%$,Size=64 %, Impurity=0.0
- $(N \leq 40.0) \wedge (f_p > 11.0\ \%) \wedge (f_c > 4.0\ \%) \wedge (N \leq 11.0) \Rightarrow P(L < 1000) = 100.0\ \%$, Size=62 %, Impurity=0.0
- $(N \leq 40.0) \wedge (f_p > 11.0\ \%) \wedge (N \leq 11.0) \wedge (f_p > 40.0\ \%) \Rightarrow P(L < 1000) = 100.0\ \%$,Size=63 %, Impurity=0.0
- $(N \leq 40.0) \wedge (f_p > 11.0\ \%) \wedge (f_c > 4.0\ \%) \Rightarrow P(L < 1000) = 100.0\ \%$, Size=70 %, Impurity=0.0
- $(N \leq 40.0) \wedge (f_p > 11.0\ \%) \wedge (f_c > 4.0\ \%) \wedge (f_p > 40.0\ \%) \Rightarrow P(L < 1000) = 100.0\ \%$,Size=62 %, Impurity=0.0
- $(N \leq 40.0) \wedge (f_p > 11.0\ \%) \wedge (N \leq 11.0) \Rightarrow P(L < 1000) = 100.0\ \%$, Size=72 %, Impurity=0.0
- $(N \leq 28.0) \wedge (f_p > 11.0\ \%) \wedge (N \leq 11.0) \wedge (f_p > 40.0\ \%) \Rightarrow P(L < 1000) = 100.0\ \%$,Size=62 %, Impurity=0.0
- $(T) \Rightarrow P(L < 1000) = 94.8\ \%$, Size=100 %, Impurity=0.049
- $(T) \Rightarrow P(L < 1000) = 95.0\ \%$, Size=100 %, Impurity=0.047
- $(T) \Rightarrow P(L < 1000) = 94.7\ \%$, Size=100 %, Impurity=0.05
- $(N \leq 40.0) \wedge (f_p > 11.0\ \%) \wedge (f_c > 2.8\ \%) \wedge (f_p > 40.0\ \%) \Rightarrow P(L < 1000) = 100.0\ \%$,Size=64 %, Impurity=0.0
- $(T) \Rightarrow P(L < 1000) = 94.8\ \%$, Size=100 %, Impurity=0.049
- $(T) \Rightarrow P(L < 1000) = 94.6\ \%$, Size=100 %, Impurity=0.051
- $(T) \Rightarrow P(L < 1000) = 95.2\ \%$, Size=100 %, Impurity=0.046
- $(T) \Rightarrow P(L < 1000) = 95.1\ \%$, Size=100 %, Impurity=0.047
- $(T) \Rightarrow P(L < 1000) = 95.5\ \%$, Size=100 %, Impurity=0.043
- $(T) \Rightarrow P(L < 1000) = 94.9\ \%$, Size=100 %, Impurity=0.049

- $(T) \Rightarrow P(L < 1000) = 94.7\ \%$, Size=100 %, Impurity=0.05
- $(T) \Rightarrow P(L < 1000) = 94.2\ \%$, Size=100 %, Impurity=0.055
- $(T) \Rightarrow P(L < 1000) = 94.1\ \%$, Size=100 %, Impurity=0.056
- $(T) \Rightarrow P(L < 1000) = 95.2\ \%$, Size=100 %, Impurity=0.046
- $(T) \Rightarrow P(L < 1000) = 95.1\ \%$, Size=100 %, Impurity=0.046
- $(T) \Rightarrow P(L < 1000) = 95.5\ \%$, Size=100 %, Impurity=0.043
- $(T) \Rightarrow P(L < 1000) = 95.0\ \%$, Size=100 %, Impurity=0.048
- $(T) \Rightarrow P(L < 1000) = 95.4\ \%$, Size=100 %, Impurity=0.044

1.3 Model I

P(L < 10 000):

- $(N \leq 40.0) \Rightarrow P(L < 10000) = 100.0\ \%$, Size=91 %, Impurity=0.0
- $(T) \Rightarrow P(L < 10000) = 99.6\ \%$, Size=100 %, Impurity=0.004
- $(T) \Rightarrow P(L < 10000) = 99.6\ \%$, Size=100 %, Impurity=0.004
- $(T) \Rightarrow P(L < 10000) = 99.5\ \%$, Size=100 %, Impurity=0.005
- $(T) \Rightarrow P(L < 10000) = 99.5\ \%$, Size=100 %, Impurity=0.005
- $(T) \Rightarrow P(L < 10000) = 99.6\ \%$, Size=100 %, Impurity=0.004
- $(T) \Rightarrow P(L < 10000) = 99.7\ \%$, Size=100 %, Impurity=0.003
- $(T) \Rightarrow P(L < 10000) = 99.4\ \%$, Size=100 %, Impurity=0.006
- $(N \leq 40.0) \wedge (f_p > 11.0\ \%) \Rightarrow P(L < 10000) = 100.0\ \%$, Size=83 %, Impurity=0.0
- $(T) \Rightarrow P(L < 10000) = 99.5\ \%$, Size=100 %, Impurity=0.005
- $(T) \Rightarrow P(L < 10000) = 99.3\ \%$, Size=100 %, Impurity=0.007
- $(T) \Rightarrow P(L < 10000) = 99.7\ \%$, Size=100 %, Impurity=0.003
- $(T) \Rightarrow P(L < 10000) = 99.8\ \%$, Size=100 %, Impurity=0.002
- $(T) \Rightarrow P(L < 10000) = 99.4\ \%$, Size=100 %, Impurity=0.006
- $(T) \Rightarrow P(L < 10000) = 99.3\ \%$, Size=100 %, Impurity=0.007
- $(T) \Rightarrow P(L < 10000) = 99.3\ \%$, Size=100 %, Impurity=0.007
- $(T) \Rightarrow P(L < 10000) = 99.8\ \%$, Size=100 %, Impurity=0.002
- $(N > 40.0) \Rightarrow P(L < 10000) = 95.7\ \%$, Size=10 %, Impurity=0.041
- $(N \leq 40.0) \Rightarrow P(L < 10000) = 100.0\ \%$, Size=92 %, Impurity=0.0
- $(N > 40.0) \Rightarrow P(L < 10000) = 95.7\ \%$, Size=9 %, Impurity=0.042
- $(N > 40.0) \Rightarrow P(L < 10000) = 95.0\ \%$, Size=9 %, Impurity=0.048

- $(N > 40.0) \Rightarrow P(L < 10000) = 95.8$ %, Size=10 %, Impurity=0.041
- $(N > 40.0) \Rightarrow P(L < 10000) = 96.7$ %, Size=9 %, Impurity=0.032
- $(N > 40.0) \Rightarrow P(L < 10000) = 96.1$ %, Size=9 %, Impurity=0.038
- $(N > 40.0) \Rightarrow P(L < 10000) = 95.5$ %, Size=9 %, Impurity=0.043

1.4 Model I

P(L < 100 000):

- $(T) \Rightarrow P(L < 100000) = 100.0$ %, Size=100 %, Impurity=0.0
- $(T) \Rightarrow P(L < 100000) = 100.0$ %, Size=100 %, Impurity=0.0
- $(N \leq 40.0) \Rightarrow P(L < 100000) = 100.0$ %, Size=92 %, Impurity=0.0
- $(f_p > 9.0$ %$) \Rightarrow P(L < 100000) = 100.0$ %, Size=92 %, Impurity=0.0
- $(T) \Rightarrow P(L < 100000) = 99.9$ %, Size=100 %, Impurity=0.001
- $(T) \Rightarrow P(L < 100000) = 99.9$ %, Size=100 %, Impurity=0.001
- $(f_p > 11.0$ %$) \Rightarrow P(L < 100000) = 100.0$ %, Size=91 %, Impurity=0.0
- $(T) \Rightarrow P(L < 100000) = 99.8$ %, Size=100 %, Impurity=0.002
- $(f_p \leq 9.0$ %$) \Rightarrow P(L < 100000) = 99.5$ %, Size=8 %, Impurity=0.005
- $(f_p \leq 9.0$ %$) \Rightarrow P(L < 100000) = 99.5$ %, Size=8 %, Impurity=0.005
- $(N > 40.0) \Rightarrow P(L < 100000) = 99.5$ %, Size=8 %, Impurity=0.005
- $(N > 40.0) \Rightarrow P(L < 100000) = 99.5$ %, Size=8 %, Impurity=0.005
- $(f_p \leq 9.0$ %$) \Rightarrow P(L < 100000) = 98.5$ %, Size=8 %, Impurity=0.014
- $(N > 40.0) \Rightarrow P(L < 100000) = 99.5$ %, Size=9 %, Impurity=0.005
- $(N > 40.0) \Rightarrow P(L < 100000) = 99.5$ %, Size=8 %, Impurity=0.005
- $(N > 40.0) \Rightarrow P(L < 100000) = 99.1$ %, Size=8 %, Impurity=0.009
- $(f_p \leq 9.0$ %$) \Rightarrow P(L < 100000) = 99.5$ %, Size=8 %, Impurity=0.005
- $(f_p \leq 9.0$ %$) \Rightarrow P(L < 100000) = 99.1$ %, Size=8 %, Impurity=0.009
- $(N > 40.0) \Rightarrow P(L < 100000) = 99.0$ %, Size=8 %, Impurity=0.009
- $(N > 40.0) \Rightarrow P(L < 100000) = 99.0$ %, Size=8 %, Impurity=0.01
- $(N > 40.0) \Rightarrow P(L < 100000) = 99.5$ %, Size=8 %, Impurity=0.005
- $(N > 40.0) \Rightarrow P(L < 100000) = 99.0$ %, Size=8 %, Impurity=0.01
- $(f_p \leq 9.0$ %$) \Rightarrow P(L < 100000) = 99.0$ %, Size=8 %, Impurity=0.01
- $(f_p \leq 9.0$ %$) \Rightarrow P(L < 100000) = 99.1$ %, Size=8 %, Impurity=0.009
- $(f_p \leq 9.0$ %$) \Rightarrow P(L < 100000) = 99.0$ %, Size=8 %, Impurity=0.009

1.5 Model II

L:

- $(f_b > 4.0\ \%) \wedge (f_a > 140.0\ \%) \wedge (N \leq 11.0) \wedge (f_b \leq 22.0\ \%) \Rightarrow L = 7.9,$ Size=13 %, Impurity=0.152
- $(f_b > 4.0\ \%) \wedge (f_a > 110.0\ \%) \wedge (N \leq 11.0) \wedge (f_b > 22.0\ \%) \Rightarrow L = 1.5,$ Size=14 %, Impurity=0.195
- $(f_b \leq 4.0\ \%) \wedge (f_a > 90.0\ \%) \wedge (f_b > 0.4\ \%) \wedge (N \leq 4.0) \Rightarrow L = 49.3,$ Size=9 %, Impurity=0.198
- $(f_b > 2.2\ \%) \wedge (f_a > 110.0\ \%) \wedge (N \leq 9.0) \wedge (f_b > 22.0\ \%) \Rightarrow L = 1.5,$ Size=14 %, Impurity=0.173
- $(f_b > 4.0\ \%) \wedge (f_a > 70.0\ \%) \wedge (N \leq 9.0) \wedge (f_b \leq 22.0\ \%) \Rightarrow L = 7.8,$ Size=13 %, Impurity=0.199
- $(f_b > 4.0\ \%) \wedge (f_a > 90.0\ \%) \wedge (N \leq 11.0) \wedge (f_b \leq 14.0\ \%) \Rightarrow L = 11.4,$ Size=11 %, Impurity=0.174
- $(f_b > 1.8\ \%) \wedge (f_a > 70.0\ \%) \wedge (N \leq 9.0) \wedge (f_b > 22.0\ \%) \Rightarrow L = 1.8,$ Size=16 %, Impurity=0.197
- $(f_b > 2.8\ \%) \wedge (f_a > 110.0\ \%) \wedge (N \leq 9.0) \wedge (f_b > 22.0\ \%) \Rightarrow L = 1.5,$ Size=15 %, Impurity=0.189
- $(f_b > 4.0\ \%) \wedge (f_a > 70.0\ \%) \wedge (N \leq 14.0) \wedge (f_b \leq 22.0\ \%) \Rightarrow L = 10.0,$ Size=14 %, Impurity=0.195
- $(f_b > 4.0\ \%) \wedge (f_a > 140.0\ \%) \wedge (N \leq 9.0) \wedge (f_b \leq 22.0\ \%) \Rightarrow L = 6.9,$ Size=11 %, Impurity=0.16
- $(f_b > 4.0\ \%) \wedge (f_a > 70.0\ \%) \wedge (N \leq 9.0) \wedge (f_b \leq 22.0\ \%) \Rightarrow L = 9.1,$ Size=13 %, Impurity=0.198
- $(f_b > 2.8\ \%) \wedge (f_a > 110.0\ \%) \wedge (N \leq 9.0) \wedge (f_b > 22.0\ \%) \Rightarrow L = 1.4,$ Size=15 %, Impurity=0.198
- $(f_b > 1.8\ \%) \wedge (f_a > 110.0\ \%) \wedge (N \leq 9.0) \wedge (f_b > 22.0\ \%) \Rightarrow L = 1.6,$ Size=15 %, Impurity=0.166
- $(f_b \leq 4.0\ \%) \wedge (f_a > 90.0\ \%) \wedge (f_b > 0.4\ \%) \wedge (N \leq 4.0) \Rightarrow L = 49.9,$ Size=9 %, Impurity=0.183
- $(f_b > 1.8\ \%) \wedge (f_a > 140.0\ \%) \wedge (N \leq 9.0) \wedge (f_b > 14.0\ \%) \Rightarrow L = 1.8,$ Size=18 %, Impurity=0.195
- $(f_b > 2.8\ \%) \wedge (f_a > 140.0\ \%) \wedge (N \leq 9.0) \wedge (f_b \leq 22.0\ \%) \Rightarrow L = 8.9,$ Size=14 %, Impurity=0.188
- $(f_b > 1.8\ \%) \wedge (f_a > 110.0\ \%) \wedge (N \leq 9.0) \wedge (f_b > 22.0\ \%) \Rightarrow L = 1.4,$ Size=14 %, Impurity=0.197
- $(f_b > 2.8\ \%) \wedge (f_a > 140.0\ \%) \wedge (N \leq 9.0) \wedge (f_b > 22.0\ \%) \Rightarrow L = 1.2,$ Size=13 %, Impurity=0.162

- $(f_b > 4.0\ \%) \wedge (f_a > 110.0\ \%) \wedge (N \leq 11.0) \wedge (f_b \leq 22.0\ \%) \Rightarrow L = 7.8,$ Size=14 %, Impurity=0.179
- $(f_b > 2.2\ \%) \wedge (f_a > 110.0\ \%) \wedge (N \leq 14.0) \wedge (f_b > 22.0\ \%) \Rightarrow L = 1.7,$ Size=15 %, Impurity=0.186
- $(f_b > 4.0\ \%) \wedge (f_a > 140.0\ \%) \wedge (N \leq 9.0) \wedge (f_b \leq 22.0\ \%) \Rightarrow L = 8.6,$ Size=13 %, Impurity=0.189
- $(f_b > 1.8\ \%) \wedge (f_a > 140.0\ \%) \wedge (f_b \leq 22.0\ \%) \wedge (N \leq 6.0) \Rightarrow L = 9.1,$ Size=12 %, Impurity=0.171
- $(f_b > 4.0\ \%) \wedge (f_a > 90.0\ \%) \wedge (N \leq 14.0) \wedge (f_b \leq 22.0\ \%) \Rightarrow L = 8.7,$ Size=13 %, Impurity=0.175
- $(f_b > 1.8\ \%) \wedge (f_a > 220.0\ \%) \wedge (N \leq 9.0) \wedge (f_b > 14.0\ \%) \Rightarrow L = 1.5,$ Size=16 %, Impurity=0.154
- $(f_b > 4.0\ \%) \wedge (f_a > 140.0\ \%) \wedge (N \leq 7.0) \wedge (f_b \leq 22.0\ \%) \Rightarrow L = 7.9,$ Size=12 %, Impurity=0.157

1.6 Model II

P(L < 1000):

- $(T) \Rightarrow P(L < 1000) = 79.0\ \%,$ Size=100 %, Impurity=0.166
- $(T) \Rightarrow P(L < 1000) = 79.2\ \%,$ Size=100 %, Impurity=0.165
- $(T) \Rightarrow P(L < 1000) = 79.2\ \%,$ Size=100 %, Impurity=0.165
- $(T) \Rightarrow P(L < 1000) = 78.5\ \%,$ Size=100 %, Impurity=0.169
- $(T) \Rightarrow P(L < 1000) = 78.9\ \%,$ Size=100 %, Impurity=0.166
- $(T) \Rightarrow P(L < 1000) = 79.0\ \%,$ Size=100 %, Impurity=0.166
- $(T) \Rightarrow P(L < 1000) = 78.7\ \%,$ Size=100 %, Impurity=0.168
- $(T) \Rightarrow P(L < 1000) = 79.8\ \%,$ Size=100 %, Impurity=0.161
- $(T) \Rightarrow P(L < 1000) = 79.3\ \%,$ Size=100 %, Impurity=0.164
- $(T) \Rightarrow P(L < 1000) = 78.8\ \%,$ Size=100 %, Impurity=0.167
- $(T) \Rightarrow P(L < 1000) = 79.6\ \%,$ Size=100 %, Impurity=0.162
- $(T) \Rightarrow P(L < 1000) = 79.4\ \%,$ Size=100 %, Impurity=0.164
- $(T) \Rightarrow P(L < 1000) = 78.9\ \%,$ Size=100 %, Impurity=0.166
- $(T) \Rightarrow P(L < 1000) = 79.1\ \%,$ Size=100 %, Impurity=0.165
- $(T) \Rightarrow P(L < 1000) = 78.3\ \%,$ Size=100 %, Impurity=0.17
- $(T) \Rightarrow P(L < 1000) = 79.7\ \%,$ Size=100 %, Impurity=0.162
- $(T) \Rightarrow P(L < 1000) = 77.9\ \%,$ Size=100 %, Impurity=0.172
- $(T) \Rightarrow P(L < 1000) = 79.5\ \%,$ Size=100 %, Impurity=0.163

- $(T) \Rightarrow P(L < 1000) = 78.4$ %, Size=100 %, Impurity=0.169
- $(T) \Rightarrow P(L < 1000) = 79.3$ %, Size=100 %, Impurity=0.164
- $(T) \Rightarrow P(L < 1000) = 79.9$ %, Size=100 %, Impurity=0.16
- $(T) \Rightarrow P(L < 1000) = 79.4$ %, Size=100 %, Impurity=0.164
- $(T) \Rightarrow P(L < 1000) = 78.7$ %, Size=100 %, Impurity=0.167
- $(T) \Rightarrow P(L < 1000) = 80.2$ %, Size=100 %, Impurity=0.159
- $(T) \Rightarrow P(L < 1000) = 79.8$ %, Size=100 %, Impurity=0.161

1.7 Model II

P(L < 10 000):

- $(T) \Rightarrow P(L < 10000) = 92.4$ %, Size=100 %, Impurity=0.07
- $(T) \Rightarrow P(L < 10000) = 92.6$ %, Size=100 %, Impurity=0.069
- $(T) \Rightarrow P(L < 10000) = 92.5$ %, Size=100 %, Impurity=0.07
- $(T) \Rightarrow P(L < 10000) = 92.0$ %, Size=100 %, Impurity=0.074
- $(T) \Rightarrow P(L < 10000) = 92.0$ %, Size=100 %, Impurity=0.074
- $(T) \Rightarrow P(L < 10000) = 92.6$ %, Size=100 %, Impurity=0.068
- $(T) \Rightarrow P(L < 10000) = 92.4$ %, Size=100 %, Impurity=0.071
- $(T) \Rightarrow P(L < 10000) = 92.7$ %, Size=100 %, Impurity=0.067
- $(T) \Rightarrow P(L < 10000) = 92.5$ %, Size=100 %, Impurity=0.069
- $(T) \Rightarrow P(L < 10000) = 92.6$ %, Size=100 %, Impurity=0.068
- $(T) \Rightarrow P(L < 10000) = 92.2$ %, Size=100 %, Impurity=0.072
- $(T) \Rightarrow P(L < 10000) = 92.8$ %, Size=100 %, Impurity=0.067
- $(T) \Rightarrow P(L < 10000) = 92.3$ %, Size=100 %, Impurity=0.071
- $(f_b > 0.28\ \%) \wedge (f_a > 14.0\ \%) \wedge (N \leq 40.0) \wedge (f_b > 1.1\ \%) \Rightarrow P(L < 10000) = 100.0$ %, Size=58 %, Impurity=0.0
- $(T) \Rightarrow P(L < 10000) = 93.1$ %, Size=100 %, Impurity=0.064
- $(T) \Rightarrow P(L < 10000) = 92.9$ %, Size=100 %, Impurity=0.066
- $(T) \Rightarrow P(L < 10000) = 92.7$ %, Size=100 %, Impurity=0.068
- $(T) \Rightarrow P(L < 10000) = 92.3$ %, Size=100 %, Impurity=0.071
- $(T) \Rightarrow P(L < 10000) = 92.8$ %, Size=100 %, Impurity=0.067
- $(f_b > 0.4\ \%) \wedge (N \leq 40.0) \wedge (f_a > 9.0\ \%) \wedge (f_a > 28.0\ \%) \Rightarrow P(L < 10000) = 100.0$ %,Size=61 %, Impurity=0.0
- $(T) \Rightarrow P(L < 10000) = 91.9$ %, Size=100 %, Impurity=0.074

- $(f_b > 0.4\ \%) \wedge (N \leq 22.0) \wedge (f_a > 11.0\ \%) \Rightarrow P(L < 10000) = 100.0\ \%$, Size=64 %, Impurity=0.0
- $(f_b > 0.18\ \%) \wedge (f_a > 18.0\ \%) \wedge (N \leq 40.0) \wedge (f_b > 0.9\ \%) \Rightarrow P(L < 10000) = 100.0\ \%$, Size=59 %, Impurity=0.0
- $(T) \Rightarrow P(L < 10000) = 91.8\ \%$, Size=100 %, Impurity=0.075
- $(f_b > 0.22\ \%) \wedge (N \leq 40.0) \wedge (f_a > 9.0\ \%) \wedge (f_a > 28.0\ \%) \Rightarrow P(L < 10000) = 100.0\ \%$, Size=63 %, Impurity=0.0

1.8 Model II

P(L < 100 000):

- $(f_b > 0.28\ \%) \wedge (N \leq 40.0) \wedge (f_a > 9.0\ \%) \Rightarrow P(L < 100000) = 100.0\ \%$, Size=70 %, Impurity=0.0
- $(T) \Rightarrow P(L < 100000) = 97.6\ \%$, Size=100 %, Impurity=0.023
- $(T) \Rightarrow P(L < 100000) = 97.9\ \%$, Size=100 %, Impurity=0.021
- $(f_b > 0.14\ \%) \wedge (N \leq 40.0) \wedge (f_a > 9.0\ \%) \Rightarrow P(L < 100000) = 100.0\ \%$, Size=74 %, Impurity=0.0
- $(T) \Rightarrow P(L < 100000) = 97.7\ \%$, Size=100 %, Impurity=0.022
- $(T) \Rightarrow P(L < 100000) = 97.9\ \%$, Size=100 %, Impurity=0.02
- $(T) \Rightarrow P(L < 100000) = 97.6\ \%$, Size=100 %, Impurity=0.024
- $(T) \Rightarrow P(L < 100000) = 97.7\ \%$, Size=100 %, Impurity=0.022
- $(T) \Rightarrow P(L < 100000) = 97.9\ \%$, Size=100 %, Impurity=0.021
- $(f_b > 0.28\ \%) \wedge (N \leq 40.0) \Rightarrow P(L < 100000) = 100.0\ \%$, Size=79 %, Impurity=0.0
- $(f_b > 0.14\ \%) \wedge (N \leq 40.0) \wedge (f_b > 0.7\ \%) \Rightarrow P(L < 100000) = 100.0\ \%$, Size=73 %, Impurity=0.0
- $(T) \Rightarrow P(L < 100000) = 97.4\ \%$, Size=100 %, Impurity=0.026
- $(f_b > 0.28\ \%) \wedge (f_a > 14.0\ \%) \Rightarrow P(L < 100000) = 100.0\ \%$, Size=75 %, Impurity=0.0
- $(f_b > 0.28\ \%) \wedge (f_b > 0.9\ \%) \wedge (N \leq 40.0) \Rightarrow P(L < 100000) = 100.0\ \%$, Size=70 %, Impurity=0.0
- $(T) \Rightarrow P(L < 100000) = 97.5\ \%$, Size=100 %, Impurity=0.024
- $(T) \Rightarrow P(L < 100000) = 97.5\ \%$, Size=100 %, Impurity=0.024
- $(T) \Rightarrow P(L < 100000) = 97.7\ \%$, Size=100 %, Impurity=0.023
- $(f_b > 0.28\ \%) \wedge (N \leq 40.0) \wedge (f_b > 0.9\ \%) \Rightarrow P(L < 100000) = 100.0\ \%$, Size=70 %, Impurity=0.0
- $(T) \Rightarrow P(L < 100000) = 97.8\ \%$, Size=100 %, Impurity=0.021
- $(T) \Rightarrow P(L < 100000) = 98.0\ \%$, Size=100 %, Impurity=0.02

- $(T) \Rightarrow P(L < 100000) = 97.8\ \%$, Size=100 %, Impurity=0.022
- $(f_b > 0.14\ \%) \wedge (f_a > 11.0\ \%) \wedge (N \leq 40.0) \Rightarrow P(L < 100000) = 100.0\ \%$, Size=72 %, Impurity=0.0
- $(f_b > 0.11\ \%) \wedge (N \leq 40.0) \wedge (f_a > 9.0\ \%) \Rightarrow P(L < 100000) = 100.0\ \%$, Size=74 %, Impurity=0.0
- $(T) \Rightarrow P(L < 100000) = 98.1\ \%$, Size=100 %, Impurity=0.019
- $(f_b > 0.11\ \%) \wedge (f_a > 7.0\ \%) \wedge (N \leq 40.0) \Rightarrow P(L < 100000) = 100.0\ \%$, Size=75 %, Impurity=0.0

1.9 Model III

L:

- $(f_c > 9.0\ \%) \wedge (N \leq 7.0) \wedge (f_p > 28.0\ \%) \wedge (f_c > 40.0\ \%) \Rightarrow L = 2.5$, Size=15 %, Impurity=0.158
- $(f_c > 9.0\ \%) \wedge (N \leq 11.0) \wedge (f_p > 40.0\ \%) \wedge (f_c > 28.0\ \%) \Rightarrow L = 3.2$, Size=20 %, Impurity=0.158
- $(f_c \leq 9.0\ \%) \wedge (N \leq 11.0) \wedge (f_p > 60.0\ \%) \wedge (N > 4.0) \Rightarrow L = 73.2$, Size=11 %, Impurity=0.156
- $(f_c \leq 9.0\ \%) \wedge (N \leq 11.0) \wedge (f_p > 60.0\ \%) \wedge (N > 4.0) \Rightarrow L = 69.4$, Size=12 %, Impurity=0.168
- $(f_c \leq 9.0\ \%) \wedge (N \leq 11.0) \wedge (f_p > 60.0\ \%) \wedge (N > 4.0) \Rightarrow L = 69.4$, Size=11 %, Impurity=0.18
- $(f_c > 11.0\ \%) \wedge (N \leq 11.0) \wedge (f_p > 40.0\ \%) \wedge (f_c \leq 40.0\ \%) \Rightarrow L = 7.6$, Size=20 %, Impurity=0.15
- $(f_c > 9.0\ \%) \wedge (N \leq 11.0) \wedge (f_p > 40.0\ \%) \wedge (f_c \leq 28.0\ \%) \Rightarrow L = 9.8$, Size=20 %, Impurity=0.17
- $(f_c \leq 9.0\ \%) \wedge (N \leq 9.0) \wedge (f_p > 70.0\ \%) \wedge (N \leq 4.0) \Rightarrow L = 24.0$,Size=9 %, Impurity=0.159
- $(f_c \leq 9.0\ \%) \wedge (N \leq 9.0) \wedge (f_p > 70.0\ \%) \wedge (N \leq 4.0) \Rightarrow L = 26.1$,Size=9 %, Impurity=0.169
- $(f_c > 7.0\ \%) \wedge (N \leq 11.0) \wedge (f_p > 28.0\ \%) \wedge (f_c \leq 28.0\ \%) \Rightarrow L = 12.3$, Size=24 %, Impurity=0.172
- $(f_c > 9.0\ \%) \wedge (N \leq 11.0) \wedge (f_p > 28.0\ \%) \wedge (f_c > 22.0\ \%) \Rightarrow L = 3.4$, Size=24 %, Impurity=0.192
- $(f_c > 9.0\ \%) \wedge (N \leq 7.0) \wedge (f_p > 28.0\ \%) \wedge (f_c > 40.0\ \%) \Rightarrow L = 2.4$, Size=15 %, Impurity=0.162
- $(f_c > 14.0\ \%) \wedge (N \leq 9.0) \wedge (f_p > 40.0\ \%) \Rightarrow L = 4.0$, Size=30 %, Impurity=0.179
- $(f_c \leq 14.0\ \%) \wedge (N \leq 14.0) \wedge (f_p > 40.0\ \%) \wedge (f_c \leq 4.0\ \%) \Rightarrow L = 67.0$, Size=12 %, Impurity=0.19

- $(f_c \leq 9.0\ \%) \wedge (N \leq 9.0) \wedge (f_p > 70.0\ \%) \wedge (N > 4.0) \Rightarrow L = 61.3,$ Size=10 %, Impurity=0.175
- $(f_c \leq 9.0\ \%) \wedge (N \leq 9.0) \wedge (f_p > 70.0\ \%) \wedge (N > 4.0) \Rightarrow L = 61.1,$Size=9 %, Impurity=0.159
- $(f_c \leq 11.0\ \%) \wedge (f_p > 40.0\ \%) \wedge (N \leq 9.0) \wedge (N \leq 4.0) \Rightarrow L = 18.9,$ Size=12 %, Impurity=0.162
- $(f_c \leq 11.0\ \%) \wedge (N \leq 11.0) \wedge (f_p > 40.0\ \%) \wedge (N \leq 4.0) \Rightarrow L = 19.4,$ Size=12 %, Impurity=0.18
- $(f_c > 9.0\ \%) \wedge (N \leq 14.0) \wedge (f_p > 28.0\ \%) \wedge (f_c > 40.0\ \%) \Rightarrow L = 2.8,$ Size=18 %, Impurity=0.196
- $(f_c \leq 9.0\ \%) \wedge (N \leq 11.0) \wedge (f_p > 60.0\ \%) \wedge (N \leq 4.0) \Rightarrow L = 23.3,$ Size=10 %, Impurity=0.149
- $(f_c \leq 9.0\ \%) \wedge (N \leq 11.0) \wedge (f_p > 60.0\ \%) \wedge (N \leq 4.0) \Rightarrow L = 24.5,$ Size=10 %, Impurity=0.165
- $(f_c > 9.0\ \%) \wedge (N \leq 11.0) \wedge (f_p > 28.0\ \%) \wedge (f_c \leq 28.0\ \%) \Rightarrow L = 10.5,$ Size=19 %, Impurity=0.17
- $(f_c > 9.0\ \%) \wedge (N \leq 11.0) \wedge (f_p > 28.0\ \%) \wedge (f_c \leq 28.0\ \%) \Rightarrow L = 10.5,$ Size=20 %, Impurity=0.165
- $(f_c \leq 9.0\ \%) \wedge (f_p > 40.0\ \%) \wedge (N \leq 7.0) \Rightarrow L = 36.7,$ Size=20 %, Impurity=0.198
- $(f_c > 18.0\ \%) \wedge (N \leq 11.0) \wedge (f_p > 60.0\ \%) \Rightarrow L = 3.7,$ Size=26 %, Impurity=0.185

1.10 Model III

P(L < 1000):

- $(N \leq 40.0) \wedge (f_p > 11.0\ \%) \wedge (f_c > 6.0\ \%) \Rightarrow P(L < 1000) = 100.0\ \%,$ Size=64 %, Impurity=0.0
- $(T) \Rightarrow P(L < 1000) = 94.1\ \%,$ Size=100 %, Impurity=0.055
- $(N \leq 22.0) \wedge (f_p > 22.0\ \%) \wedge (f_c > 4.0\ \%) \Rightarrow P(L < 1000) = 100.0\ \%,$ Size=62 %, Impurity=0.0
- $(N \leq 40.0) \wedge (f_p > 11.0\ \%) \wedge (f_c > 4.0\ \%) \wedge (N \leq 11.0) \Rightarrow P(L < 1000) = 100.0\ \%,$ Size=61 %, Impurity=0.0
- $(N \leq 22.0) \wedge (f_p > 18.0\ \%) \wedge (f_c > 4.0\ \%) \Rightarrow P(L < 1000) = 100.0\ \%,$ Size=64 %, Impurity=0.0
- $(T) \Rightarrow P(L < 1000) = 94.4\ \%,$ Size=100 %, Impurity=0.052
- $(T) \Rightarrow P(L < 1000) = 94.4\ \%,$ Size=100 %, Impurity=0.053
- $(T) \Rightarrow P(L < 1000) = 94.4\ \%,$ Size=100 %, Impurity=0.053
- $(T) \Rightarrow P(L < 1000) = 94.3\ \%,$ Size=100 %, Impurity=0.054
- $(N \leq 40.0) \wedge (f_p > 22.0\ \%) \wedge (f_c > 4.0\ \%) \Rightarrow P(L < 1000) = 100.0\ \%,$ Size=64 %, Impurity=0.0

- $(T) \Rightarrow P(L < 1000) = 94.0$ %, Size=100 %, Impurity=0.056
- $(T) \Rightarrow P(L < 1000) = 93.9$ %, Size=100 %, Impurity=0.057
- $(T) \Rightarrow P(L < 1000) = 94.9$ %, Size=100 %, Impurity=0.048
- $(N \leq 40.0) \wedge (f_p > 22.0$ %$) \wedge (N \leq 11.0) \wedge (f_i > 60.0$ %$) \Rightarrow P(L < 1000) = 100.0$ %,Size=56 %, Impurity=0.0
- $(N \leq 40.0) \wedge (f_p > 11.0$ %$) \wedge (f_c > 4.0$ %$) \wedge (N \leq 14.0) \Rightarrow P(L < 1000) = 100.0$ %, Size=62 %, Impurity=0.0
- $(T) \Rightarrow P(L < 1000) = 94.2$ %, Size=100 %, Impurity=0.055
- $(N \leq 40.0) \wedge (f_p > 22.0$ %$) \wedge (N \leq 14.0) \wedge (f_i > 60.0$ %$) \Rightarrow P(L < 1000) = 100.0$ %,Size=59 %, Impurity=0.0
- $(T) \Rightarrow P(L < 1000) = 93.7$ %, Size=100 %, Impurity=0.059
- $(T) \Rightarrow P(L < 1000) = 94.8$ %, Size=100 %, Impurity=0.05
- $(N \leq 28.0) \wedge (f_p > 22.0$ %$) \wedge (f_c > 4.0$ %$) \Rightarrow P(L < 1000) = 100.0$ %, Size=64 %, Impurity=0.0
- $(T) \Rightarrow P(L < 1000) = 94.6$ %, Size=100 %, Impurity=0.051
- $(N \leq 22.0) \wedge (f_p > 11.0$ %$) \wedge (f_c > 4.0$ %$) \Rightarrow P(L < 1000) = 100.0$ %, Size=64 %, Impurity=0.0
- $(T) \Rightarrow P(L < 1000) = 94.3$ %, Size=100 %, Impurity=0.054
- $(T) \Rightarrow P(L < 1000) = 94.1$ %, Size=100 %, Impurity=0.056
- $(N \leq 40.0) \wedge (f_p > 18.0$ %$) \wedge (f_c > 4.0$ %$) \wedge (N \leq 11.0) \Rightarrow P(L < 1000) = 100.0$ %, Size=58 %, Impurity=0.0

1.11 Model III

P(L < 10 000):

- $(f_p > 11.0$ %$) \wedge (N \leq 40.0) \Rightarrow P(L < 10000) = 100.0$ %, Size=82 %, Impurity=0.0
- $(T) \Rightarrow P(L < 10000) = 99.3$ %, Size=100 %, Impurity=0.007
- $(f_p > 9.0$ %$) \wedge (N \leq 40.0) \Rightarrow P(L < 10000) = 100.0$ %, Size=83 %, Impurity=0.0
- $(T) \Rightarrow P(L < 10000) = 99.4$ %, Size=100 %, Impurity=0.006
- $(f_p > 11.0$ %$) \Rightarrow P(L < 10000) = 100.0$ %, Size=91 %, Impurity=0.0
- $(T) \Rightarrow P(L < 10000) = 99.2$ %, Size=100 %, Impurity=0.007
- $(T) \Rightarrow P(L < 10000) = 99.3$ %, Size=100 %, Impurity=0.007
- $(T) \Rightarrow P(L < 10000) = 99.2$ %, Size=100 %, Impurity=0.008
- $(N \leq 40.0) \wedge (f_p > 11.0$ %$) \Rightarrow P(L < 10000) = 100.0$ %, Size=83 %, Impurity=0.0
- $(T) \Rightarrow P(L < 10000) = 99.4$ %, Size=100 %, Impurity=0.006

- $(T) \Rightarrow P(L < 10000) = 99.4\ \%$, Size=100 %, Impurity=0.006
- $(f_p > 11.0\ \%) \wedge (f_l > 40.0\ \%) \Rightarrow P(L < 10000) = 100.0\ \%$, Size=82 %, Impurity=0.0
- $(T) \Rightarrow P(L < 10000) = 99.1\ \%$, Size=100 %, Impurity=0.009
- $(T) \Rightarrow P(L < 10000) = 99.0\ \%$, Size=100 %, Impurity=0.009
- $(T) \Rightarrow P(L < 10000) = 99.2\ \%$, Size=100 %, Impurity=0.008
- $(T) \Rightarrow P(L < 10000) = 99.1\ \%$, Size=100 %, Impurity=0.009
- $(f_p > 11.0\ \%) \wedge (f_p > 28.0\ \%) \Rightarrow P(L < 10000) = 100.0\ \%$, Size=82 %, Impurity=0.0
- $(T) \Rightarrow P(L < 10000) = 99.5\ \%$, Size=100 %, Impurity=0.005
- $(T) \Rightarrow P(L < 10000) = 99.5\ \%$, Size=100 %, Impurity=0.005
- $(f_p > 18.0\ \%) \Rightarrow P(L < 10000) = 100.0\ \%$, Size=87 %, Impurity=0.0
- $(T) \Rightarrow P(L < 10000) = 99.0\ \%$, Size=100 %, Impurity=0.01
- $(f_p > 9.0\ \%) \wedge (f_p > 22.0\ \%) \Rightarrow P(L < 10000) = 100.0\ \%$, Size=84 %, Impurity=0.0
- $(f_p > 18.0\ \%) \wedge (N \leq 40.0) \Rightarrow P(L < 10000) = 100.0\ \%$, Size=78 %, Impurity=0.0
- $(f_p > 11.0\ \%) \Rightarrow P(L < 10000) = 100.0\ \%$, Size=91 %, Impurity=0.0
- $(T) \Rightarrow P(L < 10000) = 99.6\ \%$, Size=100 %, Impurity=0.004

1.12 Model III

P(L < 100 000):

- $(T) \Rightarrow P(L < 100000) = 100.0\ \%$, Size=100 %, Impurity=0.0

1.13 Model IV

L:

- $(N_* n_e \leq 35.5 * 10^{10}) \wedge (f_m \leq 1.1\ \%) \wedge (f_m e > 1.1\ \%) \Rightarrow L = 19072.7$, Size=8 %, Impurity=0.18
- $(N_* n_e > 70.8 * 10^{10}) \wedge (f_p m > 7.0\ \%) \wedge (N_* n_e \leq 141.3 * 10^{10}) \Rightarrow L = 163623.7$, Size=14 %, Impurity=0.184
- $(N_* n_e > 44.7 * 10^{10}) \wedge (f_p m > 7.0\ \%) \wedge (N_* n_e \leq 112.2 * 10^{10}) \wedge (f_m e \leq 1.1\ \%) \Rightarrow L = 84667.2$, Size=10 %, Impurity=0.188
- $(N_* n_e > 44.7 * 10^{10}) \wedge (f_p m > 7.0\ \%) \wedge (N_* n_e \leq 112.2 * 10^{10}) \wedge (f_m e \leq 1.1\ \%) \Rightarrow L = 69838.9$, Size=11 %, Impurity=0.189
- $(N_* n_e > 44.7 * 10^{10}) \wedge (f_m > 1.1\ \%) \wedge (f_m e \leq 1.4\ \%) \wedge (N_* n_e \leq 89.1 * 10^{10}) \Rightarrow L = 76862.5$, Size=9 %, Impurity=0.147
- $(N_* n_e > 56.2 * 10^{10}) \wedge (N_* n_e \leq 141.3 * 10^{10}) \wedge (f_p m \leq 9.0\ \%) \wedge (f_m e > 1.1\ \%) \Rightarrow L = 97414.9$, Size=8 %, Impurity=0.199

- $(N_* n_e > 70.8 * 10^{10}) \wedge (f_p m > 6.0\ \%) \wedge (f_m \leq 1.4\ \%) \Rightarrow L = 137124.0,$ Size=16 %, Impurity=0.184
- $(N_* n_e > 44.7 * 10^{10}) \wedge (f_p m > 6.0\ \%) \wedge (f_m \leq 1.1\ \%) \wedge (N_* n_e > 89.1 * 10^{10}) \Rightarrow L = 131825.7,$ Size=8 %, Impurity=0.19
- $(N_* n_e > 44.7 * 10^{10}) \wedge (f_p m > 7.0\ \%) \wedge (N_* n_e \leq 112.2 * 10^{10}) \wedge (f_m e > 0.9\ \%) \Rightarrow L = 174281.0,$ Size=13 %, Impurity=0.141
- $(N_* n_e > 44.7 * 10^{10}) \wedge (f_p m > 6.0\ \%) \wedge (f_m \leq 1.1\ \%) \wedge (N_* n_e > 89.1 * 10^{10}) \Rightarrow L = 151142.3,$ Size=9 %, Impurity=0.195
- $(N_* n_e \leq 44.7 * 10^{10}) \wedge (f_m > 0.7\ \%) \wedge (f_p m > 6.0\ \%) \wedge (f_m e \leq 0.9\ \%) \Rightarrow L = 19775.9,$Size=9 %, Impurity=0.183
- $(N_* n_e \leq 44.7 * 10^{10}) \wedge (f_m > 0.7\ \%) \wedge (f_p m \leq 9.0\ \%) \wedge (N_* n_e \leq 22.4 * 10^{10}) \Rightarrow L = 10349.5,$ Size=10 %, Impurity=0.186
- $(N_* n_e > 35.5 * 10^{10}) \wedge (f_p m > 7.0\ \%) \wedge (N_* n_e \leq 89.1 * 10^{10}) \wedge (f_m e > 1.1\ \%) \Rightarrow L = 172558.7,$ Size=8 %, Impurity=0.189
- $(N_* n_e > 70.8 * 10^{10}) \wedge (f_p m > 9.0\ \%) \wedge (f_m > 1.1\ \%) \Rightarrow L = 383721.7,$ Size=9 %, Impurity=0.197
- $(N_* n_e > 28.2 * 10^{10}) \wedge (N_* n_e > 89.1 * 10^{10}) \wedge (f_p m > 6.0\ \%) \wedge (f_m e \leq 0.9\ \%) \Rightarrow L = 140819.6,$ Size=8 %, Impurity=0.195
- $(N_* n_e > 56.2 * 10^{10}) \wedge (f_p m > 7.0\ \%) \wedge (f_m > 0.9\ \%) \wedge (f_m e \leq 1.1\ \%) \Rightarrow L = 190627.0,$ Size=10 %, Impurity=0.181
- $(N_* n_e > 56.2 * 10^{10}) \wedge (f_p m > 6.0\ \%) \wedge (N_* n_e \leq 141.3 * 10^{10}) \wedge (f_m > 0.9\ \%) \Rightarrow L = 182091.6,$ Size=15 %, Impurity=0.165
- $(N_* n_e > 44.7 * 10^{10}) \wedge (f_p m > 7.0\ \%) \wedge (N_* n_e \leq 112.2 * 10^{10}) \wedge (f_m e > 1.1\ \%) \Rightarrow L = 195905.0,$ Size=10 %, Impurity=0.176
- $(N_* n_e > 56.2 * 10^{10}) \wedge (f_m \leq 1.4\ \%) \wedge (f_p m > 6.0\ \%) \wedge (N_* n_e \leq 89.1 * 10^{10}) \Rightarrow L = 71835.3,$ Size=8 %, Impurity=0.173
- $(N_* n_e \leq 28.2 * 10^{10}) \wedge (f_p m \leq 9.0\ \%) \wedge (f_m > 1.1\ \%) \Rightarrow L = 12256.0,$ Size=8 %, Impurity=0.182
- $(N_* n_e > 56.2 * 10^{10}) \wedge (f_m > 0.9\ \%) \wedge (N_* n_e \leq 141.3 * 10^{10}) \wedge (f_p m > 9.0\ \%) \Rightarrow L = 217969.9,$ Size=9 %, Impurity=0.142
- $(N_* n_e \leq 44.7 * 10^{10}) \wedge (f_m > 0.7\ \%) \wedge (N_* n_e > 14.1 * 10^{10}) \wedge (f_m e > 1.1\ \%) \Rightarrow L = 56573.4,$ Size=11 %, Impurity=0.197
- $(N_* n_e \leq 44.7 * 10^{10}) \wedge (f_m e > 0.9\ \%) \wedge (N_* n_e > 14.1 * 10^{10}) \wedge (f_m \leq 1.1\ \%) \Rightarrow L = 25323.1,$ Size=9 %, Impurity=0.194
- $(N_* n_e > 44.7 * 10^{10}) \wedge (f_p m > 7.0\ \%) \wedge (N_* n_e \leq 112.2 * 10^{10}) \wedge (f_m e \leq 0.9\ \%) \Rightarrow L = 66327.4,$ Size=8 %, Impurity=0.173
- $(N_* n_e > 28.2 * 10^{10}) \wedge (N_* n_e > 70.8 * 10^{10}) \wedge (f_m > 1.1\ \%) \wedge (f_p m > 9.0\ \%) \Rightarrow L = 393226.6,$ Size=9 %, Impurity=0.181

1.14 Model IV

P(L < 1000):

- $(T) \Rightarrow P(L < 1000) = 0.8$ %, Size=100 %, Impurity=0.008
- $(N_* n_e > 14.1 * 10^{10}) \wedge (f_j > 40.0$ %$) \Rightarrow P(L < 1000) = 0.0$ %, Size=77 %, Impurity=0.0
- $(T) \Rightarrow P(L < 1000) = 0.6$ %, Size=100 %, Impurity=0.006
- $(T) \Rightarrow P(L < 1000) = 0.7$ %, Size=100 %, Impurity=0.007
- $(T) \Rightarrow P(L < 1000) = 1.0$ %, Size=100 %, Impurity=0.01
- $(T) \Rightarrow P(L < 1000) = 0.7$ %, Size=100 %, Impurity=0.007
- $(T) \Rightarrow P(L < 1000) = 0.7$ %, Size=100 %, Impurity=0.006
- $(T) \Rightarrow P(L < 1000) = 0.9$ %, Size=100 %, Impurity=0.009
- $(T) \Rightarrow P(L < 1000) = 0.9$ %, Size=100 %, Impurity=0.009
- $(N_* n_e > 11.2 * 10^{10}) \wedge (f_j > 40.0$ %$) \Rightarrow P(L < 1000) = 0.0$ %, Size=81 %, Impurity=0.0
- $(N_* n_e > 14.1 * 10^{10}) \wedge (f_j > 40.0$ %$) \wedge (f_p m > 4.0$ %$) \Rightarrow P(L < 1000) = 0.0$ %, Size=66 %, Impurity=0.0
- $(T) \Rightarrow P(L < 1000) = 0.9$ %, Size=100 %, Impurity=0.008
- $(T) \Rightarrow P(L < 1000) = 0.8$ %, Size=100 %, Impurity=0.008
- $(T) \Rightarrow P(L < 1000) = 0.6$ %, Size=100 %, Impurity=0.006
- $(N_* n_e > 11.2 * 10^{10}) \wedge (f_j > 40.0$ %$) \wedge (f_m e > 0.6$ %$) \Rightarrow P(L < 1000) = 0.0$ %, Size=68 %, Impurity=0.0
- $(N_* n_e > 11.2 * 10^{10}) \wedge (f_m e > 0.6$ %$) \Rightarrow P(L < 1000) = 0.0$ %, Size=76 %, Impurity=0.0
- $(f_j > 28.0$ %$) \wedge (N_* n_e > 14.1 * 10^{10}) \wedge (f_p m > 4.0$ %$) \Rightarrow P(L < 1000) = 0.0$ %, Size=68 %, Impurity=0.0
- $(T) \Rightarrow P(L < 1000) = 1.1$ %, Size=100 %, Impurity=0.011
- $(T) \Rightarrow P(L < 1000) = 1.1$ %, Size=100 %, Impurity=0.01
- $(T) \Rightarrow P(L < 1000) = 0.5$ %, Size=100 %, Impurity=0.005
- $(f_j > 40.0$ %$) \wedge (N_* n_e > 14.1 * 10^{10}) \wedge (f_p m > 4.0$ %$) \Rightarrow P(L < 1000) = 0.0$ %, Size=66 %, Impurity=0.0
- $(T) \Rightarrow P(L < 1000) = 1.0$ %, Size=100 %, Impurity=0.01
- $(f_j > 28.0$ %$) \wedge (N_* n_e > 14.1 * 10^{10}) \Rightarrow P(L < 1000) = 0.0$ %, Size=80 %, Impurity=0.0
- $(f_j > 40.0$ %$) \wedge (f_p m > 2.8$ %$) \wedge (N_* n_e > 14.1 * 10^{10}) \Rightarrow P(L < 1000) = 0.0$ %, Size=70 %, Impurity=0.0
- $(N_* n_e > 11.2 * 10^{10}) \wedge (f_p m > 2.8$ %$) \wedge (R_* \leq 4.0) \Rightarrow P(L < 1000) = 0.0$ %, Size=75 %, Impurity=0.0

1.15 Model IV

P(L < 10 000):

- $(T) \Rightarrow P(L < 10000) = 16.1$ %, Size=100 %, Impurity=0.135
- $(T) \Rightarrow P(L < 10000) = 16.2$ %, Size=100 %, Impurity=0.136
- $(T) \Rightarrow P(L < 10000) = 16.2$ %, Size=100 %, Impurity=0.136
- $(T) \Rightarrow P(L < 10000) = 16.3$ %, Size=100 %, Impurity=0.136
- $(T) \Rightarrow P(L < 10000) = 17.0$ %, Size=100 %, Impurity=0.141
- $(T) \Rightarrow P(L < 10000) = 16.7$ %, Size=100 %, Impurity=0.139
- $(T) \Rightarrow P(L < 10000) = 17.0$ %, Size=100 %, Impurity=0.141
- $(T) \Rightarrow P(L < 10000) = 15.8$ %, Size=100 %, Impurity=0.133
- $(T) \Rightarrow P(L < 10000) = 16.6$ %, Size=100 %, Impurity=0.138
- $(T) \Rightarrow P(L < 10000) = 17.3$ %, Size=100 %, Impurity=0.143
- $(T) \Rightarrow P(L < 10000) = 17.2$ %, Size=100 %, Impurity=0.142
- $(T) \Rightarrow P(L < 10000) = 16.0$ %, Size=100 %, Impurity=0.134
- $(T) \Rightarrow P(L < 10000) = 16.7$ %, Size=100 %, Impurity=0.139
- $(T) \Rightarrow P(L < 10000) = 15.6$ %, Size=100 %, Impurity=0.132
- $(T) \Rightarrow P(L < 10000) = 17.7$ %, Size=100 %, Impurity=0.146
- $(T) \Rightarrow P(L < 10000) = 16.1$ %, Size=100 %, Impurity=0.135
- $(T) \Rightarrow P(L < 10000) = 17.2$ %, Size=100 %, Impurity=0.143
- $(T) \Rightarrow P(L < 10000) = 15.9$ %, Size=100 %, Impurity=0.134
- $(T) \Rightarrow P(L < 10000) = 16.6$ %, Size=100 %, Impurity=0.139
- $(T) \Rightarrow P(L < 10000) = 17.3$ %, Size=100 %, Impurity=0.143
- $(T) \Rightarrow P(L < 10000) = 17.7$ %, Size=100 %, Impurity=0.145
- $(T) \Rightarrow P(L < 10000) = 16.6$ %, Size=100 %, Impurity=0.138
- $(T) \Rightarrow P(L < 10000) = 17.4$ %, Size=100 %, Impurity=0.144
- $(T) \Rightarrow P(L < 10000) = 18.1$ %, Size=100 %, Impurity=0.148
- $(N_* n_e > 14.1 * 10^{10}) \wedge (N_* n_e > 56.2 * 10^{10}) \wedge (f_p m > 6.0\ \%) \wedge (f_m > 0.9\ \%) \Rightarrow P(L < 10000) = 0.0$ %, Size=20 %, Impurity=0.0

1.16 Model IV

P(L < 100 000):

- $(N_* n_e \leq 70.8 * 10^{10}) \wedge (N_* n_e \leq 35.5 * 10^{10}) \wedge (f_m \leq 1.1\ \%) \wedge (n_e > 2.2) \Rightarrow P(L < 100000) = 100.0$ %, Size=9 %, Impurity=0.0

- $(N_*n_e \leq 70.8 * 10^{10}) \wedge (N_*n_e \leq 35.5 * 10^{10}) \wedge (f_m \leq 1.1\ \%) \wedge (N_*n_e \leq 17.8 * 10^{10}) \Rightarrow P(L < 100000) = 100.0\ \%$, Size=9 %, Impurity=0.0
- $(N_*n_e \leq 70.8 * 10^{10}) \wedge (N_*n_e \leq 35.5 * 10^{10}) \wedge (f_m \leq 1.1\ \%) \wedge (f_pm \leq 9.0\ \%) \Rightarrow P(L < 100000) = 100.0\ \%$, Size=10 %, Impurity=0.0
- $(N_*n_e \leq 70.8 * 10^{10}) \wedge (f_me \leq 0.9\ \%) \wedge (f_m \leq 1.4\ \%) \wedge (n_e > 2.2) \Rightarrow P(L < 100000) = 100.0\ \%$, Size=9 %, Impurity=0.0
- $(N_*n_e \leq 70.8 * 10^{10}) \wedge (f_m \leq 1.1\ \%) \wedge (N_*n_e \leq 35.5 * 10^{10}) \wedge (f_m \leq 0.7\ \%) \Rightarrow P(L < 100000) = 100.0\ \%$, Size=10 %, Impurity=0.0
- $(N_*n_e \leq 70.8 * 10^{10}) \wedge (f_m \leq 1.1\ \%) \wedge (N_*n_e \leq 44.7 * 10^{10}) \wedge (N_*n_e \leq 22.4 * 10^{10}) \Rightarrow P(L < 100000) = 100.0\ \%$, Size=12 %, Impurity=0.0
- $(N_*n_e \leq 44.7 * 10^{10}) \wedge (f_m \leq 1.4\ \%) \wedge (n_e > 1.8) \wedge (f_me \leq 1.1\ \%) \Rightarrow P(L < 100000) = 100.0\ \%$, Size=11 %, Impurity=0.0
- $(N_*n_e \leq 70.8 * 10^{10}) \wedge (N_*n_e \leq 35.5 * 10^{10}) \wedge (f_pm > 11.0\ \%) \Rightarrow P(L < 100000) = 80.1\ \%$, Size=11 %, Impurity=0.159
- $(N_*n_e > 70.8 * 10^{10}) \wedge (f_pm > 7.0\ \%) \wedge (f_m > 1.1\ \%) \Rightarrow P(L < 100000) = 9.1\ \%$,Size=11 %, Impurity=0.083
- $(N_*n_e \leq 70.8 * 10^{10}) \wedge (f_m \leq 1.1\ \%) \wedge (N_*n_e \leq 35.5 * 10^{10}) \wedge (f_me \leq 1.1\ \%) \Rightarrow P(L < 100000) = 100.0\ \%$, Size=10 %, Impurity=0.0
- $(N_*n_e \leq 56.2 * 10^{10}) \wedge (f_m \leq 1.1\ \%) \wedge (n_e > 1.8) \wedge (f_pm \leq 9.0\ \%) \Rightarrow P(L < 100000) = 100.0\ \%$, Size=10 %, Impurity=0.0
- $(N_*n_e \leq 70.8 * 10^{10}) \wedge (f_m \leq 1.1\ \%) \wedge (N_*n_e \leq 35.5 * 10^{10}) \wedge (n_e > 2.2) \Rightarrow P(L < 100000) = 100.0\ \%$, Size=9 %, Impurity=0.0
- $(N_*n_e \leq 70.8 * 10^{10}) \wedge (N_*n_e \leq 35.5 * 10^{10}) \wedge (f_m \leq 1.4\ \%) \Rightarrow P(L < 100000) = 97.0\ \%$, Size=24 %, Impurity=0.029
- $(N_*n_e \leq 70.8 * 10^{10}) \Rightarrow P(L < 100000) = 82.4\ \%$, Size=62 %, Impurity=0.145
- $(N_*n_e \leq 70.8 * 10^{10}) \wedge (f_pm \leq 11.0\ \%) \wedge (N_*n_e \leq 35.5 * 10^{10}) \wedge (f_m > 1.4\ \%) \Rightarrow P(L < 100000) = 89.7\ \%$, Size=9 %, Impurity=0.093
- $(N_*n_e \leq 70.8 * 10^{10}) \wedge (N_*n_e \leq 35.5 * 10^{10}) \wedge (f_m \leq 1.1\ \%) \Rightarrow P(L < 100000) = 98.9\ \%$, Size=19 %, Impurity=0.011
- $(N_*n_e \leq 56.2 * 10^{10}) \wedge (f_m \leq 1.1\ \%) \wedge (N_*n_e \leq 35.5 * 10^{10}) \wedge (N_*n_e \leq 17.8 * 10^{10}) \Rightarrow P(L < 100000) = 100.0\ \%$, Size=9 %, Impurity=0.0
- $(N_*n_e \leq 70.8 * 10^{10}) \wedge (N_*n_e \leq 28.2 * 10^{10}) \wedge (f_m \leq 1.4\ \%) \wedge (f_pm \leq 9.0\ \%) \Rightarrow P(L < 100000) = 100.0\ \%$, Size=11 %, Impurity=0.0
- $(N_*n_e \leq 70.8 * 10^{10}) \wedge (N_*n_e \leq 35.5 * 10^{10}) \wedge (f_m \leq 1.1\ \%) \Rightarrow P(L < 100000) = 98.4\ \%$, Size=19 %, Impurity=0.016
- $(N_*n_e \leq 70.8 * 10^{10}) \wedge (f_m \leq 1.1\ \%) \wedge (N_*n_e \leq 44.7 * 10^{10}) \wedge (f_pm \leq 9.0\ \%) \Rightarrow P(L < 100000) = 100.0\ \%$, Size=12 %, Impurity=0.0

- $(N_* n_e \leq 70.8 * 10^{10}) \wedge (N_* n_e \leq 35.5 * 10^{10}) \Rightarrow P(L < 100000) = 91.2\ \%$, Size=37 %, Impurity=0.08
- $(N_* n_e \leq 70.8 * 10^{10}) \wedge (N_* n_e \leq 35.5 * 10^{10}) \wedge (f_m \leq 1.1\ \%) \wedge (N_* n_e > 17.8 * 10^{10}) \Rightarrow P(L < 100000) = 97.8\ \%$, Size=10 %, Impurity=0.022
- $(N_* n_e \leq 44.7 * 10^{10}) \wedge (f_m \leq 1.8\ \%) \Rightarrow P(L < 100000) = 93.3\ \%$,Size=34 %, Impurity=0.063
- $(N_* n_e \leq 70.8 * 10^{10}) \wedge (f_m \leq 1.1\ \%) \wedge (N_* n_e \leq 44.7 * 10^{10}) \wedge (n_e > 2.2) \Rightarrow P(L < 100000) = 100.0\ \%$, Size=10 %, Impurity=0.0
- $(N_* n_e \leq 56.2 * 10^{10}) \Rightarrow P(L < 100000) = 84.2\ \%$, Size=54 %, Impurity=0.133

1.17 Supermodel

P(L < 1000):

- $(N_* n_e > 0.0 * 10^{10}) \wedge (f_p m > 7.0\ \%) \Rightarrow P(L < 1000) = 0.0\ \%$, Size=14 %, Impurity=0.0
- $(f_p m \leq 40.0\ \%) \wedge (N_* n_e > 35.5 * 10^{10}) \Rightarrow P(L < 1000) = 0.0\ \%$, Size=15 %, Impurity=0.0
- $(N_* n_e > 0.0 * 10^{10}) \wedge (f_m > 0.9\ \%) \Rightarrow P(L < 1000) = 0.0\ \%$, Size=16 %, Impurity=0.0
- $(f_g \leq 40.0\ \%) \wedge (N_* n_e > 35.5 * 10^{10}) \Rightarrow P(L < 1000) = 0.0\ \%$, Size=15 %, Impurity=0.0
- $(f_m e \leq 18.0\ \%) \wedge (f_m > 0.9\ \%) \Rightarrow P(L < 1000) = 0.0\ \%$, Size=15 %, Impurity=0.0
- $(ModelIV) \wedge (N_* n_e > 35.5 * 10^{10}) \Rightarrow P(L < 1000) = 0.0\ \%$, Size=16 %, Impurity=0.0
- $(f_g \leq 40.0\ \%) \wedge (f_p m > 7.0\ \%) \Rightarrow P(L < 1000) = 0.0\ \%$, Size=14 %, Impurity=0.0
- $(f_m e \leq 18.0\ \%) \wedge (N_* n_e > 35.5 * 10^{10}) \Rightarrow P(L < 1000) = 0.0\ \%$, Size=15 %, Impurity=0.0
- $(N_* n_e > 0.0 * 10^{10}) \wedge (N_* n_e > 35.5 * 10^{10}) \Rightarrow P(L < 1000) = 0.0\ \%$,Size=15 %, Impurity=0.0
- $(f_m \leq 18.0\ \%) \wedge (f_m > 0.9\ \%) \Rightarrow P(L < 1000) = 0.0\ \%$, Size=16 %, Impurity=0.0
- $(f_g \leq 40.0\ \%) \wedge (f_m > 0.9\ \%) \Rightarrow P(L < 1000) = 0.0\ \%$, Size=16 %, Impurity=0.0
- $(ModelIV) \wedge (f_m > 0.9\ \%) \Rightarrow P(L < 1000) = 0.0\ \%$, Size=15 %, Impurity=0.0
- $(f_g \leq 40.0\ \%) \wedge (N_* n_e > 44.7 * 10^{10}) \Rightarrow P(L < 1000) = 0.0\ \%$, Size=14 %, Impurity=0.0
- $(f_m \leq 18.0\ \%) \wedge (f_p m > 6.0\ \%) \wedge (f_m > 1.1\ \%) \Rightarrow P(L < 1000) = 0.0\ \%$, Size=8 %, Impurity=0.0
- $(ModelIV) \wedge (f_m > 0.9\ \%) \Rightarrow P(L < 1000) = 0.1\ \%$, Size=16 %, Impurity=0.001
- $(f_m \leq 18.0\ \%) \wedge (N_* n_e > 35.5 * 10^{10}) \wedge (N \leq 4.0) \Rightarrow P(L < 1000) = 0.0\ \%$, Size=8 %, Impurity=0.0
- $(ModelIV) \wedge (f_m e > 0.9\ \%) \Rightarrow P(L < 1000) = 0.0\ \%$, Size=15 %, Impurity=0.0
- $(N_* n_e > 0.0 * 10^{10}) \wedge (f_m e > 0.9\ \%) \Rightarrow P(L < 1000) = 0.0\ \%$, Size=15 %, Impurity=0.0
- $(f_m \leq 18.0\ \%) \wedge (f_m e > 0.9\ \%) \Rightarrow P(L < 1000) = 0.0\ \%$, Size=14 %, Impurity=0.0
- $(f_g \leq 40.0\ \%) \wedge (f_m > 0.9\ \%) \Rightarrow P(L < 1000) = 0.1\ \%$, Size=15 %, Impurity=0.001

- $(f_m > 18.0\ \%) \wedge (f_b > 2.8\ \%) \wedge (N > 22.0) \Rightarrow P(L < 1000) = 73.0\ \%$, Size=9 %, Impurity=0.197
- $(f_m e \leq 18.0\ \%) \wedge (N_* n_e > 35.5 * 10^{10}) \wedge (f_m > 1.1\ \%) \Rightarrow P(L < 1000) = 0.0\ \%$, Size=8 %, Impurity=0.0
- $(f_m e \leq 18.0\ \%) \Rightarrow P(L < 1000) = 0.7\ \%$, Size=25 %, Impurity=0.006
- $(ModelIV) \wedge (f_p m > 6.0\ \%) \wedge (N \leq 4.0) \Rightarrow P(L < 1000) = 0.0\ \%$, Size=8 %, Impurity=0.0
- $(f_m > 18.0\ \%) \wedge (f_b > 2.8\ \%) \wedge (N > 22.0) \Rightarrow P(L < 1000) = 75.5\ \%$, Size=9 %, Impurity=0.185

1.18 Supermodel

P(L < 10 000):

- $(N_* n_e \leq 11.2 * 10^{10}) \wedge (f_b > 2.8\ \%) \wedge (f_c > 90.0\ \%) \wedge (f_a > 110.0\ \%) \Rightarrow P(L < 10000) = 100.0\ \%$, Size=10 %, Impurity=0.0
- $(N_* n_e \leq 11.2 * 10^{10}) \wedge (f_b > 2.2\ \%) \wedge (f_c > 90.0\ \%) \wedge (f_a > 110.0\ \%) \Rightarrow P(L < 10000) = 100.0\ \%$, Size=10 %, Impurity=0.0
- $(N_* n_e \leq 8.9{*}10^{10}) \wedge (f_b > 2.8\ \%) \wedge (f_c > 90.0\ \%) \wedge (f_a > 110.0\ \%) \Rightarrow P(L < 10000) = 100.0\ \%$, Size=10 %, Impurity=0.0
- $(T) \Rightarrow P(L < 10000) = 77.0\ \%$, Size=100 %, Impurity=0.177
- $(T) \Rightarrow P(L < 10000) = 77.4\ \%$, Size=100 %, Impurity=0.175
- $(N_* n_e \leq 8.9{*}10^{10}) \wedge (f_b > 2.2\ \%) \wedge (f_c > 90.0\ \%) \wedge (f_a > 110.0\ \%) \Rightarrow P(L < 10000) = 100.0\ \%$, Size=10 %, Impurity=0.0
- $(T) \Rightarrow P(L < 10000) = 77.6\ \%$, Size=100 %, Impurity=0.174
- $(T) \Rightarrow P(L < 10000) = 77.5\ \%$, Size=100 %, Impurity=0.174
- $(T) \Rightarrow P(L < 10000) = 77.1\ \%$, Size=100 %, Impurity=0.177
- $(T) \Rightarrow P(L < 10000) = 77.7\ \%$, Size=100 %, Impurity=0.173
- $(T) \Rightarrow P(L < 10000) = 77.7\ \%$, Size=100 %, Impurity=0.173
- $(T) \Rightarrow P(L < 10000) = 77.3\ \%$, Size=100 %, Impurity=0.175
- $(T) \Rightarrow P(L < 10000) = 76.9\ \%$, Size=100 %, Impurity=0.178
- $(T) \Rightarrow P(L < 10000) = 76.7\ \%$, Size=100 %, Impurity=0.179
- $(T) \Rightarrow P(L < 10000) = 77.0\ \%$, Size=100 %, Impurity=0.177
- $(T) \Rightarrow P(L < 10000) = 77.3\ \%$, Size=100 %, Impurity=0.175
- $(T) \Rightarrow P(L < 10000) = 76.8\ \%$, Size=100 %, Impurity=0.178
- $(T) \Rightarrow P(L < 10000) = 77.7\ \%$, Size=100 %, Impurity=0.173
- $(T) \Rightarrow P(L < 10000) = 77.1\ \%$, Size=100 %, Impurity=0.177
- $(T) \Rightarrow P(L < 10000) = 77.8\ \%$, Size=100 %, Impurity=0.173

- $(T) \Rightarrow P(L < 10000) = 77.0$ %, Size=100 %, Impurity=0.177
- $(T) \Rightarrow P(L < 10000) = 77.7$ %, Size=100 %, Impurity=0.173
- $(T) \Rightarrow P(L < 10000) = 77.8$ %, Size=100 %, Impurity=0.173
- $(T) \Rightarrow P(L < 10000) = 77.6$ %, Size=100 %, Impurity=0.174
- $(T) \Rightarrow P(L < 10000) = 77.5$ %, Size=100 %, Impurity=0.174

1.19 Supermodel

P(L < 100 000):

- $(N_* n_e \leq 44.7 * 10^{10}) \wedge (N_* n_e \leq 11.2 * 10^{10}) \wedge (f_b > 2.8\ \%) \wedge (f_c \leq 90.0\ \%) \Rightarrow P(L < 100000) =$ 100.0 %, Size=50 %, Impurity=0.0
- $(N_* n_e \leq 44.7 * 10^{10}) \wedge (N_* n_e \leq 11.2 * 10^{10}) \wedge (f_b > 2.2\ \%) \wedge (f_c \leq 90.0\ \%) \Rightarrow P(L < 100000) =$ 100.0 %, Size=50 %, Impurity=0.0
- $(N_* n_e \leq 35.5 * 10^{10}) \wedge (N_* n_e \leq 7.1 * 10^{10}) \wedge (f_b > 2.8\ \%) \wedge (N \leq 22.0) \Rightarrow P(L < 100000) =$ 100.0 %, Size=59 %, Impurity=0.0
- $(N_* n_e \leq 35.5 * 10^{10}) \wedge (N_* n_e \leq 7.1 * 10^{10}) \wedge (f_b > 2.8\ \%) \wedge (N \leq 28.0) \Rightarrow P(L < 100000) =$ 100.0 %, Size=60 %, Impurity=0.0
- $(N_* n_e \leq 35.5 * 10^{10}) \wedge (N_* n_e \leq 7.1 * 10^{10}) \wedge (f_b > 2.8\ \%) \wedge (f_c \leq 90.0\ \%) \Rightarrow P(L < 100000) =$ 100.0 %, Size=50 %, Impurity=0.0
- $(T) \Rightarrow P(L < 100000) = 91.0$ %, Size=100 %, Impurity=0.082
- $(T) \Rightarrow P(L < 100000) = 90.9$ %, Size=100 %, Impurity=0.082
- $(T) \Rightarrow P(L < 100000) = 91.0$ %, Size=100 %, Impurity=0.082
- $(T) \Rightarrow P(L < 100000) = 91.2$ %, Size=100 %, Impurity=0.081
- $(T) \Rightarrow P(L < 100000) = 91.2$ %, Size=100 %, Impurity=0.081
- $(N_* n_e \leq 35.5 * 10^{10}) \wedge (N_* n_e \leq 7.1 * 10^{10}) \wedge (f_a > 70.0\ \%) \wedge (N \leq 22.0) \Rightarrow P(L < 100000) =$ 100.0 %, Size=59 %, Impurity=0.0
- $(T) \Rightarrow P(L < 100000) = 90.8$ %, Size=100 %, Impurity=0.084
- $(N_* n_e \leq 35.5 * 10^{10}) \wedge (N_* n_e \leq 7.1 * 10^{10}) \wedge (f_b > 2.2\ \%) \wedge (N \leq 28.0) \Rightarrow P(L < 100000) =$ 100.0 %, Size=60 %, Impurity=0.0
- $(T) \Rightarrow P(L < 100000) = 90.9$ %, Size=100 %, Impurity=0.082
- $(T) \Rightarrow P(L < 100000) = 90.9$ %, Size=100 %, Impurity=0.083
- $(T) \Rightarrow P(L < 100000) = 91.1$ %, Size=100 %, Impurity=0.081
- $(T) \Rightarrow P(L < 100000) = 91.1$ %, Size=100 %, Impurity=0.081
- $(N_* n_e \leq 35.5 * 10^{10}) \wedge (N_* n_e \leq 7.1 * 10^{10}) \wedge (f_b > 2.2\ \%) \wedge (N \leq 22.0) \Rightarrow P(L < 100000) =$ 100.0 %, Size=59 %, Impurity=0.0
- $(T) \Rightarrow P(L < 100000) = 91.0$ %, Size=100 %, Impurity=0.082

- $(T) \Rightarrow P(L < 100000) = 91.1$ %, Size=100 %, Impurity=0.081
- $(T) \Rightarrow P(L < 100000) = 91.1$ %, Size=100 %, Impurity=0.081
- $(T) \Rightarrow P(L < 100000) = 90.8$ %, Size=100 %, Impurity=0.084
- $(T) \Rightarrow P(L < 100000) = 90.7$ %, Size=100 %, Impurity=0.084
- $(T) \Rightarrow P(L < 100000) = 91.2$ %, Size=100 %, Impurity=0.08
- $(T) \Rightarrow P(L < 100000) = 90.7$ %, Size=100 %, Impurity=0.084