models = [RandomForestRegressor(),GradientBoostingRegressor(),

ExtraTreesRegressor(),lgb.LGBMRegressor(),XGBRegressor(),svm.SVC(C=1.0,kernel='linear')]

原始数据只进行fft

x\_train,x\_test,y\_train,y\_test = train\_test\_split(train,label,random\_state=1,train\_size=0.7)

RF: 0.142329, 0.0935

GBR: 0.188800, 0.0558

Extra: 0.183300, 0.0367

lgb: 0.046943, 0.0529

xgb: 0.164902, 0.0693

SVM: 0, 0

x\_train,x\_test,y\_train,y\_test = train\_test\_split(train,label,random\_state=1,train\_size=0.6)

RF: 0.162648, 0.0483

GBR: 0.253627, 0.0877

Extra: 0.262132, 0.0712

lgb: 0.043580, 0.0533

xgb: 0.196367, 0.1114

SVM: 0.000000, 0.0000

x\_train,x\_test,y\_train,y\_test = train\_test\_split(train,label,random\_state=1,train\_size=0.5)

RF: 0.111699, 0.0587

GBR: 0.199923, 0.0708

Extra: 0.223451, 0.0738

lgb: 0.160894, 0.3216

xgb: 0.190075, 0.0670

SVM: 0.000000, 0.0000

x\_train,x\_test,y\_train,y\_test = train\_test\_split(train,label,random\_state=1,train\_size=0.4)

RF: 0.216506, 0.1149

GBR: 0.283876, 0.1296

Extra: 0.277379, 0.0555

lgb: 0.046484, 0.0698

xgb: 0.242351, 0.1157

SVM: 0.320215, 0.0070

x\_train,x\_test,y\_train,y\_test = train\_test\_split(train,label,random\_state=1,train\_size=0.3)

RF: 0.305235, 0.1033

GBR: 0.205092, 0.0785

Extra: 0.297891, 0.0692

lgb: 0.169462, 0.1200

xgb: 0.186458, 0.0666

SVM: 0.532104, 0.3091

求导后

RF: 0.120940, 0.0913

GBR: 0.066007, 0.0751

Extra: 0.075803, 0.0340

lgb: 0.065584, 0.0344

xgb: 0.033489, 0.0189

SVM: 0.288977, 0.0076

求导后

RF: 0.174767, 0.0709

GBR: 0.093345, 0.0585

Extra: 0.030090, 0.0140

lgb: 0.003338, 0.0065

xgb: 0.029425, 0.0149

SVM: 0.000000, 0.0000

集成学习 gbf,xgb, LGB

65, 0, 35, 0.8844031906856749

**回归方法：**

700条作为训练，300条作为测试,求导，不加噪声

正确率：

RF测试集准确率： 0.4405940594059406

GBR测试集准确率： 0.4504950495049505

Extra测试集准确率： 0.5445544554455446

lgb测试集准确率： 0.8910891089108911

xgb测试集准确率： 0.7475247524752475

SVM测试集准确率： 0.8316831683168316

集成svm, xgb, LGB

[30, 45, 25, 0.995049504950495]

700条作为训练，300条作为测试,不求导，不加噪声

RFR测试集准确率： 0.4504950495049505

GBR测试集准确率： 0.297029702970297

ETR测试集准确率： 0.4405940594059406

LGR测试集准确率： 0.44554455445544555

XGR测试集准确率： 0.5

SVM测试集准确率： 0.297029702970297

**分类方法：**

700条作为训练，300条作为测试,求导，不加噪声

"RF", "GBC","DTC","KNN","LGB","XGB","SVM","GNB","LR",”GPC”

RF测试集准确率： 0.5495049504950495

GBC测试集准确率： 0.30198019801980197

DTC测试集准确率： 0.6683168316831684

KNN测试集准确率： 0.7722772277227723

LGB测试集准确率： 0.44554455445544555

XGB测试集准确率： 0.297029702970297

SVM测试集准确率： 0.8316831683168316

GNB测试集准确率： 0.7871287128712872

LR测试集准确率： 1.0

GPC测试集准确率： 0.7821782178217822

投票分类

（KNN, GNB, SVM）：

无权重投票0.77

有权重投票（非常快）

最优结果为[1, 3, 3, 0.8910891089108911]

(KNN, GPC, SVM ):

无权重0.806930693069307

有权重(比较慢，7秒训练加测试)

最优结果[1, 1, 1, 0.8910891089108911]

KNN, DTC, SVM

无 0.7871287128712872

有 [2, 1, 2, 0.8514851485148515]

DTC GNB GPC

VotingClassifier 0.7871287128712872

[2, 1, 3, 0.8910891089108911]

GPC GNB SVM

HARD 0.806930693069307

SOFT[2, 1, 3, 0.8465346534653465]

('GNB', SVM), ('DTC', GNB), ('GPC', DTC)

VotingClassifier 0.801980198019802

[3, 3, 3, 0.9108910891089109]

SCM GPC DTC

VotingClassifier 0.8217821782178217

[2, 2, 2, 0.8663366336633663]

GNB GPC KNN

VotingClassifier 0.7821782178217822

[2, 3, 1, 0.8910891089108911]

GPC KNN DTC

VotingClassifier 0.7673267326732673

[2, 2, 2, 0.7920792079207921]

SVM KNN

[1, 1, 0.7722772277227723]

SVM GPC

[3, 1, 0.806930693069307]

SVM GNB

[3, 2, 0.8910891089108911]

SVM DTC

[3, 1, 0.806930693069307]

GNB DTC

[1, 1, 0.7326732673267327]

GNB KNN

[1, 1, 0.7871287128712872]

GNB GPC

[3, 1, 0.8910891089108911]

GPC KNN

VotingClassifier 0.7821782178217822

[1, 1, 0.7722772277227723]

GPC DTC

VotingClassifier 0.8415841584158416

[3, 1, 0.6683168316831684]

KNN DTC

VotingClassifier 0.8168316831683168

[2, 2, 0.8168316831683168]

SVM GNB GPC KNN

VotingClassifier 0.806930693069307

[1, 2, 1, 1, 0.8910891089108911]

SVM GNB GPC DTC

VotingClassifier 0.8217821782178217

[3, 3, 1, 3, 0.9603960396039604]

GNB GPC KNN DTC

VotingClassifier 0.7871287128712872

[3, 1, 2, 1, 0.8910891089108911]

SVM GNB KNN DTC

VotingClassifier 0.7871287128712872

[3, 1, 3, 1, 0.8910891089108911]

SVM GPC KNN DTC

VotingClassifier 0.8118811881188119

[2, 2, 1, 3, 0.8564356435643564]

五种

700条作为训练，300条作为测试,不求导，不加噪声

RF测试集准确率： 0.43564356435643564

GBC测试集准确率： 0.297029702970297

DTC测试集准确率： 0.5544554455445545

KNN测试集准确率： 0.44554455445544555

LGB测试集准确率： 0.5

XGB测试集准确率： 0.297029702970297

SVM测试集准确率： 0.44554455445544555

GNB测试集准确率： 0.47029702970297027

LR测试集准确率： 1.0

GPC测试集准确率： 0.5

50条数据用来训练

RF测试集准确率： 0.39348370927318294

GBC测试集准确率： 0.34210526315789475

DTC测试集准确率： 0.4949874686716792

KNN测试集准确率： 0.5902255639097744

LGB测试集准确率： 0.21177944862155387

XGB测试集准确率： 0.6040100250626567

SVM测试集准确率： 0.9924812030075187

GNB测试集准确率： 0.9010025062656641

LR测试集准确率： 0.518796992481203

GPC测试集准确率： 0.7969924812030075

('GNB', GPC), ('DTC', SVM), ('D', GNB)],voting='soft',weights=[3,1,1]

0.9387755102040817

GPC SVM

[2, 1, 0.9108910891089109]

GPC GNB

[1, 1, 0.6039603960396039]

SVM GNB

[3, 1, 0.6138613861386139]