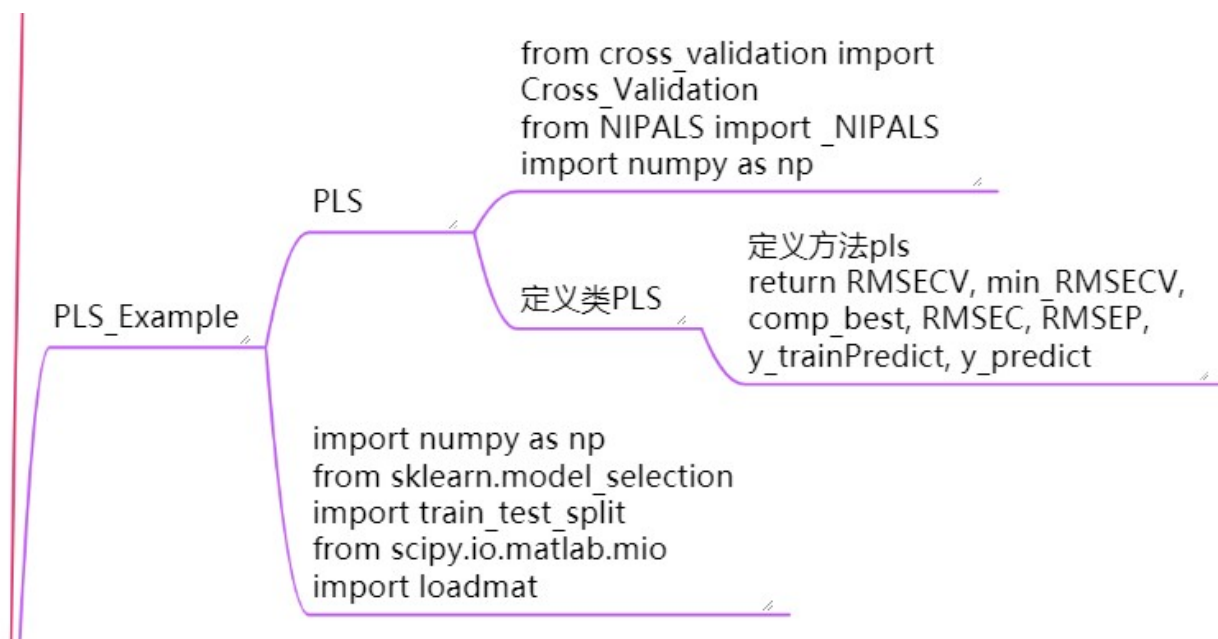
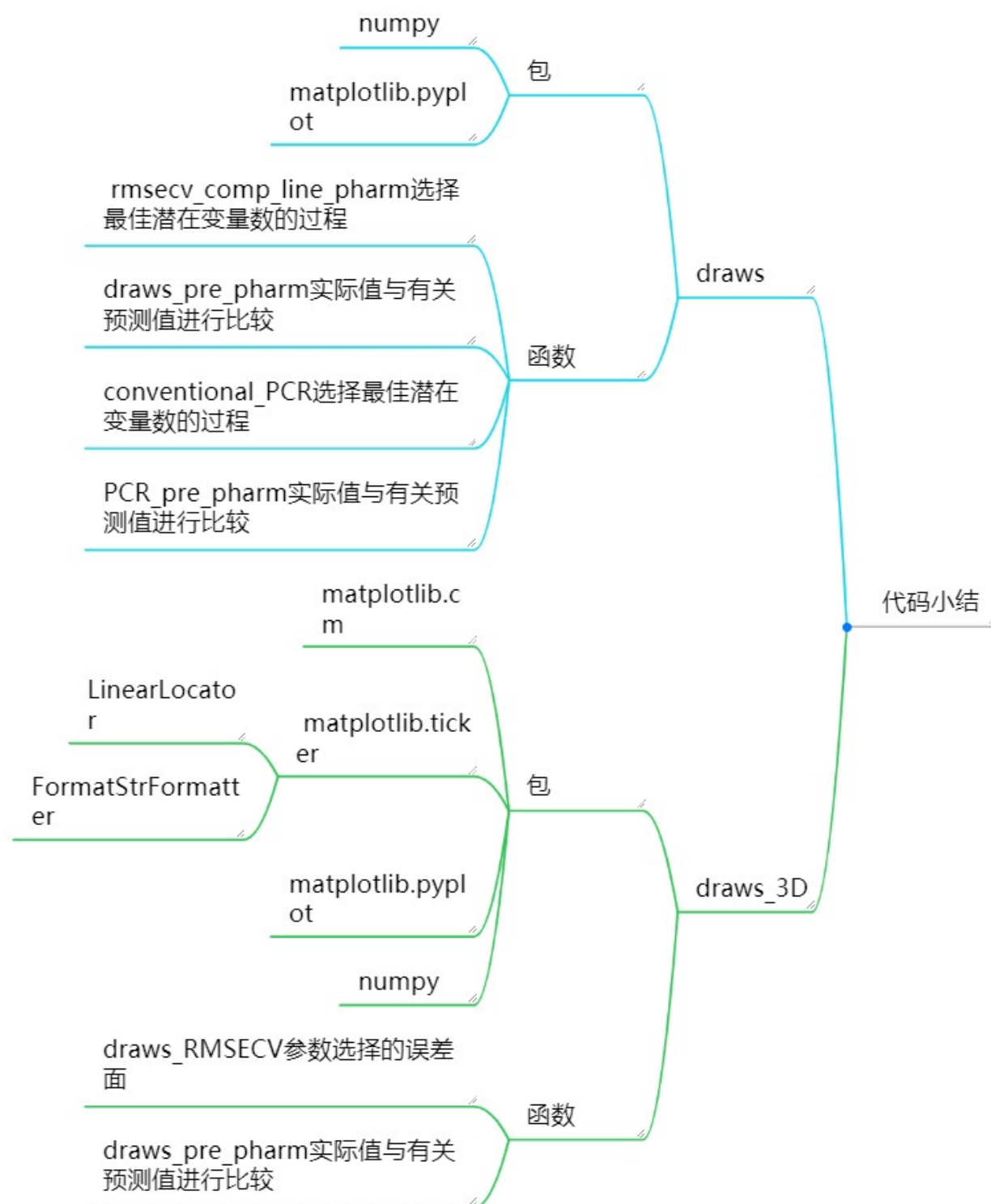


PLS_Example





```

In [3]: import numpy as np
        from sklearn.model_selection import train_test_split
        from scipy.io.matlab.mio import loadmat
        from PLS import PLS
        from draws import rmsecv_comp_line_pharm, draws_pre_pharm
  
```

```

In [2]: if __name__ == '__main__':
    fname = loadmat('E:\Documents\DAY\cornmat.mat')
    #print fname.keys()
    X = ('m5', 'mp5', 'mp6')
    Y = ('oil', 'starch', 'pro', 'water')
    for a in X: #对每个instrument
        rmsecv_list = []
        Y_test = []
        Y_predict = []
        Y_trainPredict = []
        Y_train = []
        for b in Y:
            x = fname[a]
            y = fname[b][:, 0:1]
            #print x.shape, y.shape
            x_train, x_test, y_train, y_test = train_test_split(x, y, test_size=
0.2, random_state=0)
            demo = PLS(x_train, y_train, x_test, y_test, n_fold=10, max_componen
ts=9)
            RMSECV, min_RMSECV, comp_best, RMSEC, RMSEP, y_trainPredict, y_predi
ct = demo.pls()
            rmsecv_list.append(RMSECV)
            Y_test.append(np.squeeze(y_test).tolist()) #数组降维并转换为list
            Y_predict.append(np.squeeze(y_predict).tolist())
            Y_trainPredict.append(np.squeeze(y_trainPredict).tolist())
            Y_train.append(np.squeeze(y_train).tolist())
            print a,b
            print 'RMSECV', RMSECV
            print 'min_RMSECV', min_RMSECV
            print 'comp_best', comp_best
            print 'RMSEP:', RMSEP
            print '\n'
        print "The selection process of the optimal latent variables number from
PLS model about the ",a
        rmsecv_comp_line_pharm(9, rmsecv_list)
        print "The actual value compared with the predicted value about the ",
a, " instrument."
        draws_pre_pharm(Y_test, Y_predict, Y_trainPredict, Y_train)

```

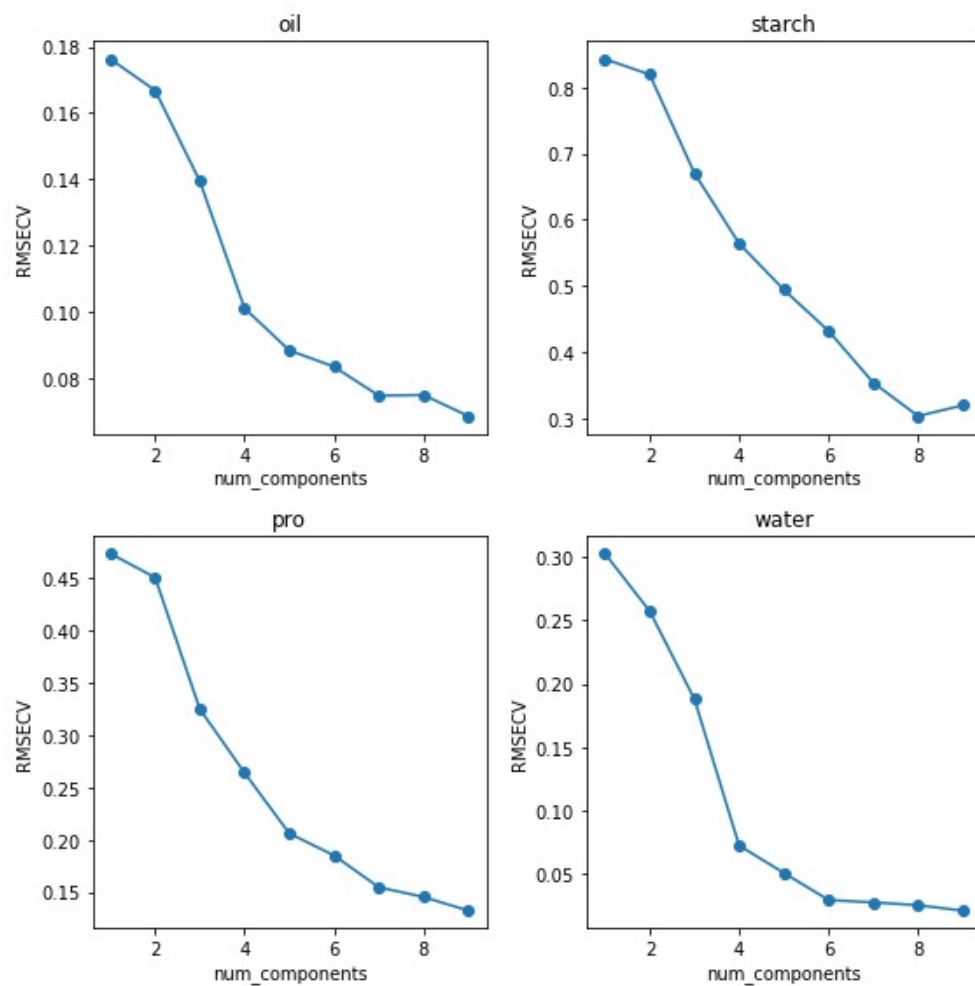
```
m5 oil
RMSECV [ 0.17629096  0.16681719  0.13940448  0.10102171  0.08829704  0.0833613
4
    0.07462155  0.07482885  0.06846579]
min_RMSECV 0.0684657921342
comp_best 9
RMSEP: [ 0.06048119]
```

```
m5 starch
RMSECV [ 0.84287271  0.81953334  0.67030555  0.56394261  0.49403892  0.4316933
5
    0.35344      0.30304482  0.3191829 ]
min_RMSECV 0.303044815403
comp_best 8
RMSEP: [ 0.28423622]
```

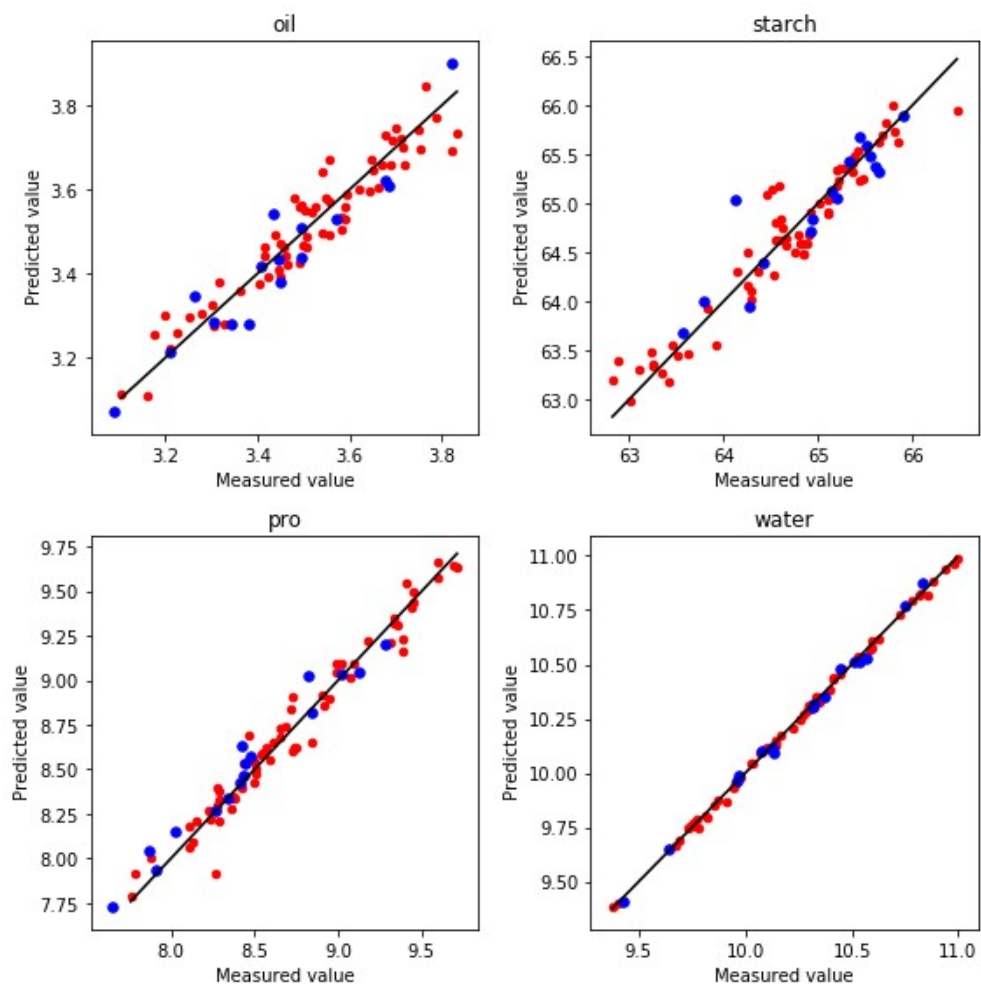
```
m5 pro
RMSECV [ 0.47366436  0.45083695  0.32488889  0.26400453  0.20601404  0.1849906
1
    0.15457974  0.14524952  0.13223247]
min_RMSECV 0.132232472901
comp_best 9
RMSEP: [ 0.1028038]
```

```
m5 water
RMSECV [ 0.30269952  0.25737487  0.18808281  0.072574      0.05098757  0.0296102
2
    0.02774756  0.02554763  0.02129437]
min_RMSECV 0.0212943734628
comp_best 9
RMSEP: [ 0.0238987]
```

The selection process of the optimal latent variables number from PLS model about the m5



The actual value compared with the predicted value about the m5 instrument.



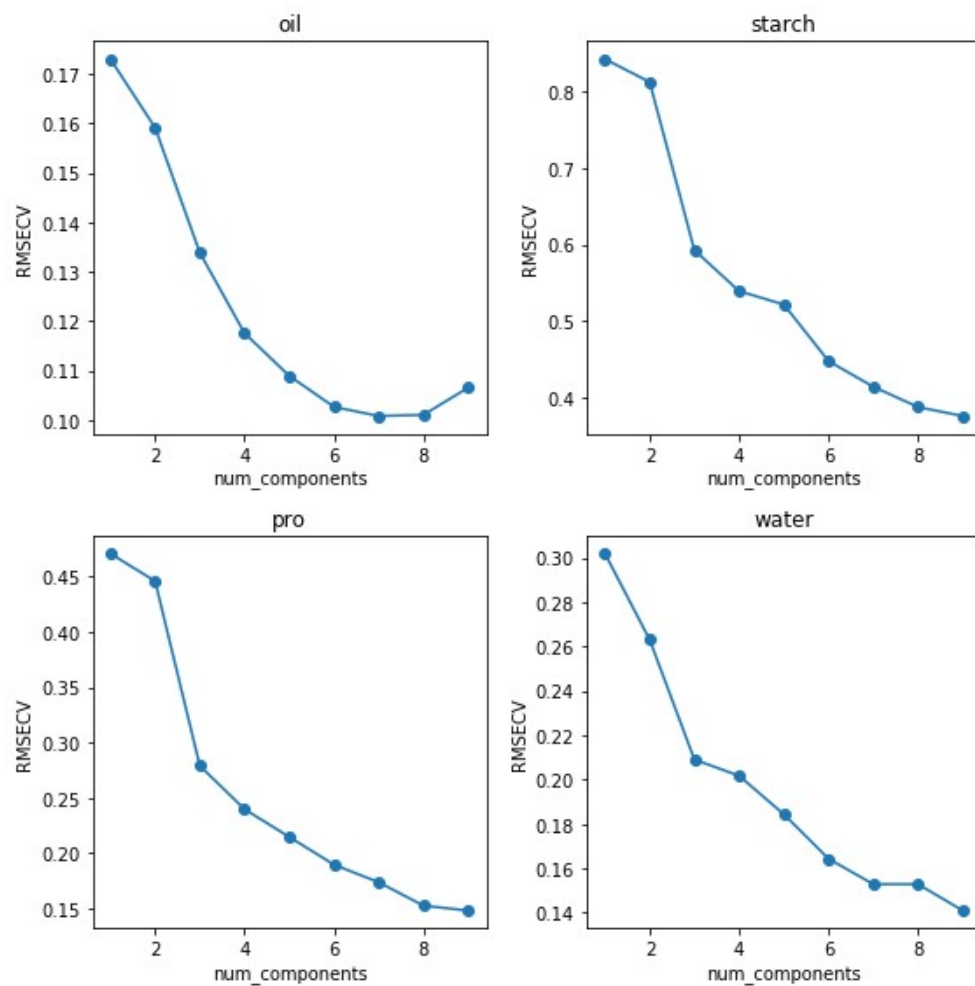
```
mp5 oil
RMSECV [ 0.17305513  0.15916037  0.13384274  0.11755294  0.10892071  0.1026341
6
    0.10078927  0.10102846  0.10654359]
min_RMSECV 0.100789270821
comp_best 7
RMSEP: [ 0.07055259]
```

```
mp5 starch
RMSECV [ 0.84306041  0.81294549  0.59268484  0.53894313  0.52135504  0.447189
    0.41362547  0.38701688  0.37524013]
min_RMSECV 0.375240126108
comp_best 9
RMSEP: [ 0.34004861]
```

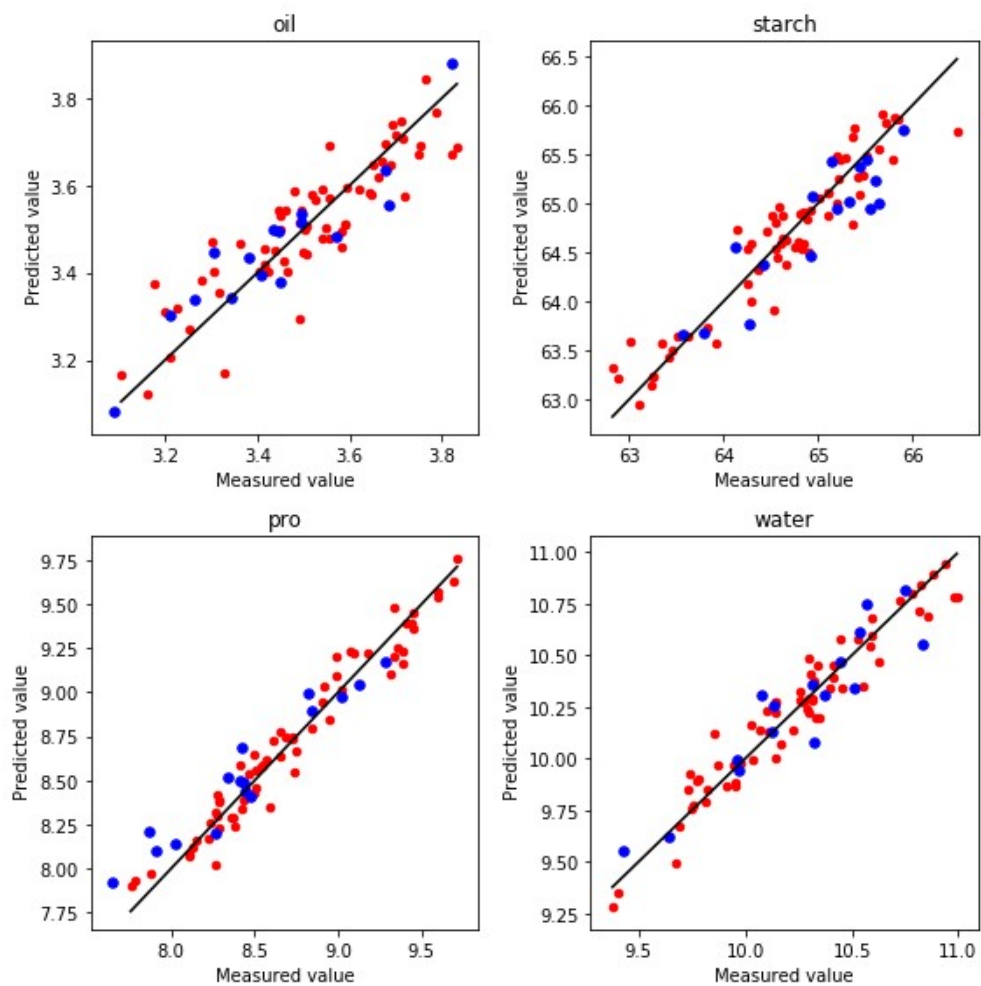
```
mp5 pro
RMSECV [ 0.47075969  0.44586737  0.27886217  0.2396058  0.21453646  0.1894598
7
    0.17352615  0.1524408  0.14797374]
min_RMSECV 0.147973741433
comp_best 9
RMSEP: [ 0.16101876]
```

```
mp5 water
RMSECV [ 0.30187712  0.26307321  0.20904577  0.20171082  0.18436796  0.1643146
7
    0.15284302  0.15286832  0.14095779]
min_RMSECV 0.14095778542
comp_best 9
RMSEP: [ 0.13670961]
```

The selection process of the optimal latent variables number from PLS model about the mp5



The actual value compared with the predicted value about the mp5 instrument.



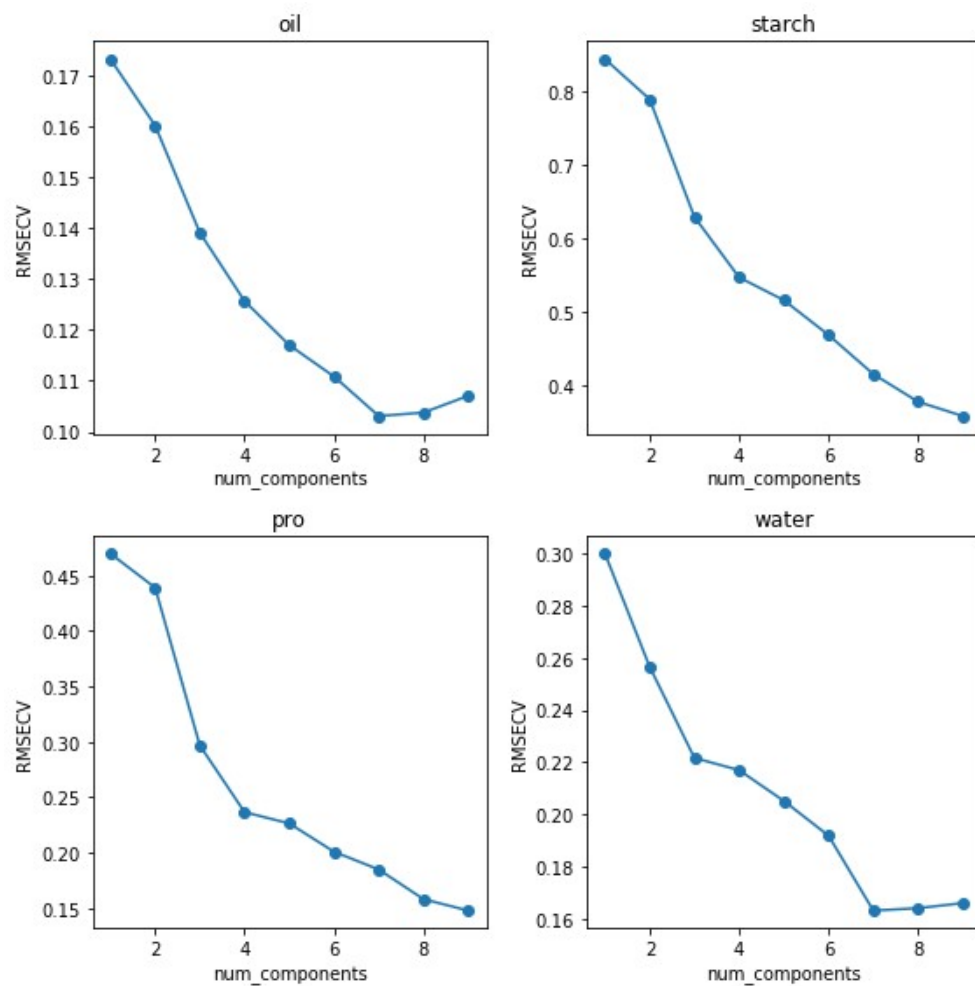
```
mp6 oil
RMSECV [ 0.17331899  0.16023794  0.13914462  0.12570084  0.11702873  0.1108517
8
    0.10308057  0.10376007  0.10706935]
min_RMSECV 0.103080572518
comp_best 7
RMSEP: [ 0.07013598]
```

```
mp6 starch
RMSECV [ 0.84374778  0.78911515  0.62904305  0.54680608  0.51579505  0.4684237
9
    0.41528782  0.37768861  0.35826078]
min_RMSECV 0.358260775913
comp_best 9
RMSEP: [ 0.31259899]
```

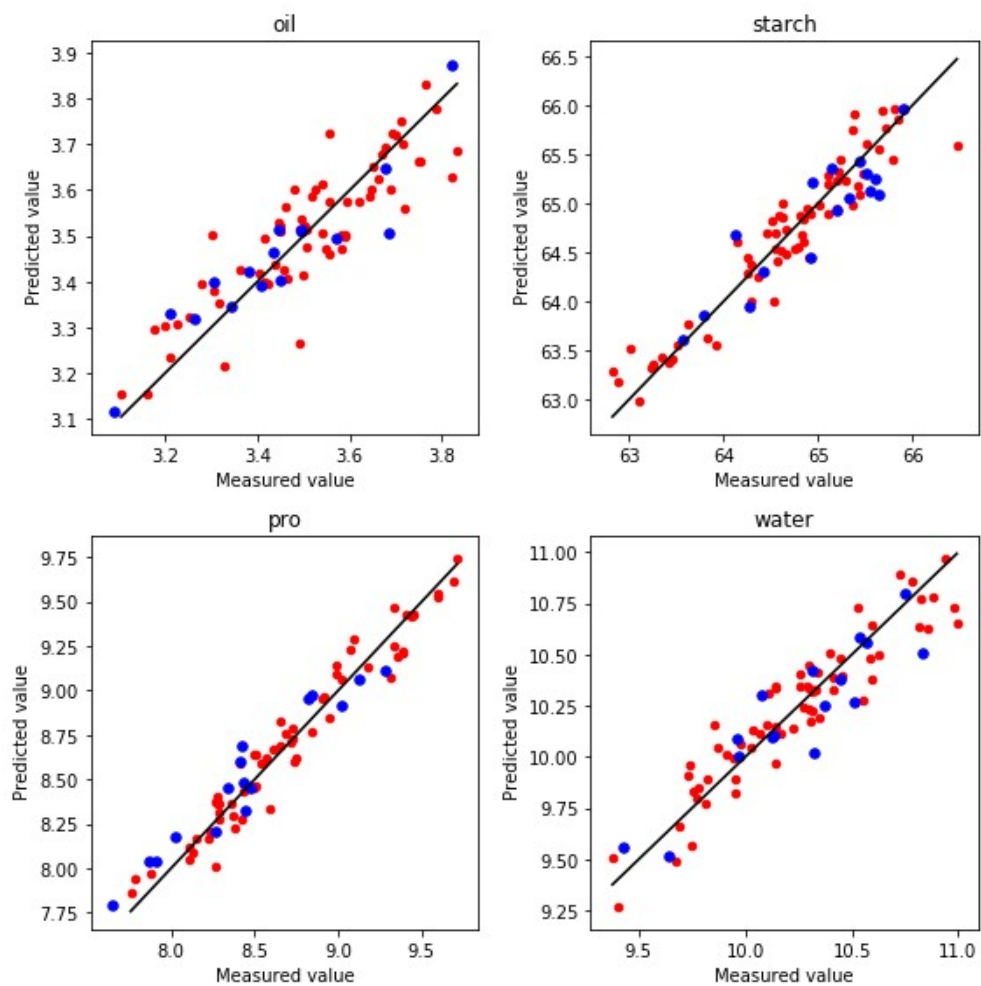
```
mp6 pro
RMSECV [ 0.46988772  0.43916345  0.29678658  0.23660799  0.22643758  0.2009111
7
    0.18487403  0.15813341  0.14781656]
min_RMSECV 0.147816560997
comp_best 9
RMSEP: [ 0.14034578]
```

```
mp6 water
RMSECV [ 0.3000477  0.25664927  0.2217029  0.21699924  0.20520017  0.1918609
5
    0.16315016  0.1640678  0.16602371]
min_RMSECV 0.163150159884
comp_best 7
RMSEP: [ 0.15609604]
```

The selection process of the optimal latent variables number from PLS model about the mp6



The actual value compared with the predicted value about the mp6 instrument.



In []: