设原矩阵为A=[A1, A2, A3, ..., An]，矩阵A有m个样本，n个维度

A中心化矩阵为Z=[A1-E1, A2-E2, A3-E3, ..., An-En]=[X1, X2, X3, ..., Xn]

则ZT=[X1,

X2,

X3,

...

Xn]

注：E1, E2, E3, ..., En是n个维度的均值

计算Z的协方差矩阵为C，即

C=[ cov(X1,X1) cov(X1,X2) cov(X1,X3) ... cov(X1,Xn)

cov(X2,X1) cov(X2,X2) cov(X2,X3) ... cov(X2,Xn)

cov(X3,X1) covX3,X2) cov(X3,X3) ... cov(X3,Xn)

...

cov(Xn,X1) cov(Xn,X2) cov(Xn,X3) ... cov(Xn,Xn)]

=[ X12/m X1\*X2/m X1\*X3/m ... X1\*Xn/m

X2\*X1/m X22/m X2\*X3/m ... X2\*Xn/m

X3\*X1/m X3\*X2/m X32/m ... X3\*Xn/m

...

Xn\*X1/m Xn\*X2/m Xn\*X3/m ... Xn2/m]

= 1/m [ X12 X1\*X2 X1\*X3 ... X1\*Xn

X2\*X1 X22 X2\*X3 ... X2\*Xn

X3\*X1 X3\*X2 X32 ... X3\*Xn

...

Xn\*X1 Xn\*X2 Xn\*X3 ... Xn2]

=ZT\*Z/m