a.

Method 1: use the matrix calculation

M =

-0.7679	0.4938	0.0234	-0.0067
0.0852	0.0915	0.9065	0.0878
-0.1827	-0.2988	0.0742	1.0000

-0.7679	0.4938	0.0234	-0.0067
0.0852	0.0915	0.9065	0.0878
-0.1827	-0.2988	0.0742	1

Mehod 2: use the SVD

M =

0.4583	-0.2947	-0.0140	0.0040
-0.0509	-0.0546	-0.5411	-0.0524
0.1090	0.1783	-0.0443	0.5968

These two methods can both calculate the right projection matrix

First Point:

<u, v> = <1.0467, -0.3626>

Last Point:

<u, v> = <0.1419, -0.4518>

1.0467	-0.3626	0.0027
-1.6840	-0.3979	0.0027
-0.9448	-0.4205	0.0012
1.0670	0.0686	0.0018
0.6083	-0.0765	8.8366e-...
1.2553	-0.6466	0.0016
-0.2699	0.8628	0.0012
-0.4569	-0.3667	0.0022
-0.7918	0.0289	0.0024
0.7321	0.6364	0.0019
-1.0545	0.3289	0.0042
0.3485	0.3384	0.0022
0.3162	0.1169	0.0032
-0.4314	0.0251	9.6588e-...
-0.4859	0.2993	0.0094
0.6119	0.0821	0.0014
-0.4081	0.2926	6.1994e-...
-0.1119	-0.3005	0.0016
0.5123	-0.0569	8.6915e-...
0.1419	-0.4518	0.0016

The third column is the residual

b.

K=8	0.0038	0.0035	0.0033	0.0028	0.0010	0.0015	0.0040	0.0075	0.0053	0.0084
K=12	0.0075	0.0062	0.0063	0.0043	0.0040	0.0037	0.0013	0.0013	0.0016	0.0015
K=16	0.0013	0.0027	0.0019	0.0039	0.0043	0.0025	0.0014	0.0010	0.0034	0.0025

Actually, I think I do not find any linear relationship between the value of K and the average residual. Because every date does not have any relationship, its more dependent on randomness。

M =

-0.7674	0.4929	0.0272	-0.0068
0.0845	0.0915	0.9045	0.0875
-0.1837	-0.3007	0.0764	-1.0000

c.

camera =

-1.5126	-2.3517	0.2827

-1.5126	-2.3517	0.2827

2.

a.

F =

-6.6070e-07	7.9103e-06	-0.0019
8.8240e-06	1.2138e-06	0.0172
-9.0738e-04	-0.0264	0.9995

b.

F =

-5.3626e-07	7.9036e-06	-0.0019
8.8354e-06	1.2132e-06	0.0172
-9.0738e-04	-0.0264	0.9995

c.

ps4-2-c-1.png

ps4-2-c-2.png