In[6]:=

```
Manipulate[Row[{If[start,
    Dynamic@Show[processM[CurrentImage[], jiankong, {n, m}], ImageSize → 350],
    Show[Image@Table[0, {240}, {320}], ImageSize → 350]],
   Dynamic[Refresh[If[start,
      If[jiankong && (! SameQ[s1, Null]) && (! SameQ[s2, Null]) && (! SameQ[α, Null]),
       processCh[{n, m}, dynamiczuobiao, k, s1, s2, α],
       ListLinePlot[u,
        AspectRatio → 0.4, ImageSize → 575, Background → GrayLevel[0.3],
        PlotRange → {{0, 50}, {0, 180}}, PlotLabel →
         Style["实时监控曲线", {RGBColor[1, 0, 1], 15}],
        Frame → True, PlotStyle → Red]], ListLinePlot[{0}, AspectRatio → 0.4,
       ImageSize → 575, Background → GrayLevel[0.3], PlotRange → {{0, 50}, {0, 180}}
       , PlotLabel → Style["实时监控曲线", {RGBColor[1, 0, 1], 15}],
       Frame → True, PlotStyle → Red]],
     UpdateInterval → 1], TrackedSymbols → {}]}, Spacer[20]],
 Item[Row[{Row[
    {"", "", Button[Style["检查CCD", {15}], If[! start, CreateDialog[CurrentImage[]]]
      , ImageSize → {130, 30}], Button[Style["垂直校准", {15}],
      If[! start, CreateWindow[DialogNotebook[
          (Manipulate[Framed[Dynamic@Show[imgt, ImageSize → 400]],
           Item[Style["垂直校准与k值的测量", {17, Blue}], ControlPlacement → Top],
           Delimiter,
           Item[Row[{"", Column[{Button[Style["拍摄"], imgt := Show[CurrentImage[],
                    Graphics[{Red, Circle[{n, m}, 7], Line[{{0, m}, {320, m}}],
                      Line[{{n, 0}, {n, 240}}]}]]],
                  ImageSize → {150, 25}],
                 Button[Style["拍照"], imgt = CurrentImage[],
                  ImageSize → {150, 25}]}]}, Spacer[30]], ControlPlacement → Right],
           Delimiter,
           Item[Style["k值的测量\n", {15, Bold}], ControlPlacement → Right],
           Item[
            Column[{Control[{{p, {0, 0}, {0, 0}}, "p"}}], Control[{{l, 0, "l"}}]},
             Spacings → 3, Frame → All, FrameStyle → GrayLevel[0.6]],
            ControlPlacement → Right],
           Item[Column[{Row[{"", Button[Style["计算", {Red, 15}],
                 (If[l ≠ 0, k = Norm[p[[1]] - p[[2]]]/l])],
                ImageSize → {150, 30}], ""}, Spacer[30]],
             Row[{"", Dynamic[Style[StringForm["k= `1`", NumberForm[
                   k, {8, 4}]], {Red, 15}]], ""},
              Spacer[50]]
             }, Spacings → 2, Frame → All,
             FrameStyle → GrayLevel[0.6]], ControlPlacement → Right],
           Delimiter,
           Item[Dynamic@
             Style[StringForm["参照点左标: (`1` , `2`)", NumberForm[N[n], {4, 1}],
               NumberForm[N[m], {4, 1}]], 15], ControlPlacement → Right],
           Item[Manipulator[Dynamic[n], {1, 320},
             Appearance → "Labeled"], ControlPlacement → Bottom],
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            Item[Manipulator[Dynamic[m], {1, 240}, Appearance → "Labeled"],
             ControlPlacement → Bottom],
            Initialization :→ (imgt := Show[CurrentImage[],
                Graphics[{Red, Circle[{n, m}, 7],
                  Line[{{0, m}, {320, m}}], Line[{{n, 0}, {n, 240}}]}]])],
        WindowTitle -> "仪器调整与k值的侧量", WindowSize → All]]
      , ImageSize → {130, 30}]}, Spacer[30]],
   Row[{Dynamic@If[start, Button[Style["停止拍摄", {15}], If[! jiankong, start = False]
      , ImageSize → {130, 30}],
     Button[Style["开始拍摄", {15}], start = True, ImageSize → {130, 30}]],
    Button[Style["开始监控", {Red, 15}],
     If[start, jiankong = True], ImageSize → {130, 30}],
    Button[Style["停止监控", {Red, 15}], If[start, jiankong = False]
     , ImageSize → {130, 30}]}, Spacer[40]]}, Spacer[120]], ControlPlacement → Top],
Item[Row[{Column[{
    Row[{"距离换算系数:", Framed@InputField[Dynamic[k], FieldSize → 24]}, Spacer[3]],
    Null,
    Row[{"镜屏距离:", Framed@InputField[Dynamic[s1], FieldSize → 24]}, Spacer[3]],
    Null,
    Row[{"镜镜距离:", Framed@InputField[Dynamic[s2], FieldSize → 24]}, Spacer[3]],
    Null,
    Row[{"旋转角度:", Framed@InputField[Dynamic[α], FieldSize → 24]}, Spacer[3]]},
   Right],
  Grid[{
    {Row[{Style["数据记录与周期分析", {RGBColor[0, 0, 0.5], 20}], ""}], Null},
    {Null},
    {Row[
      {"存储位置:", Framed@InputField[Dynamic[directoryin], String, FieldSize → 23],
       FileNameSetter[Dynamic[directoryin], "Directory"]}, Spacer[3]],
     Row[{Button["建立文件流", Module[{}, Quiet[stmp = OpenAppend[directoryin]];
         If[! SameQ[stmp, $Failed],
          CreateDialog[Style["文件流创建成功!", {Blue, 20}]],
          CreateDialog[Style["文件流创建失败!", {Red, 20}]]];
         fileflag = True;]]}]}, {Null},
    {Dynamic[Refresh[
       If[jiankong && (! SameQ[s1, Null]) && (! SameQ[s2, Null]) && (! SameQ[α, Null]),
        If[fileflag, If[savestart, processSave[stmp, t0, {n, m}, dynamiczuobiao,
           k, s1, s2, α]; Style[StringForm["正在记录...  `1`", nn++], {15, Red}],
          Style["未记录", {15, Red}]], Style["未创建文件流", {15, Red}] ],
        Style["未开始监控", {15, Red}]], UpdateInterval → 1], TrackedSymbols → {}]
     , Row[{Button["开始记录", If[fileflag, t0 = AbsoluteTime[];
         WriteString[stmp, "{", InputForm[t0], ","]; savestart = True], ImageSize → 85],
       Button["停止记录", If[savestart, savestart = False; t1 = AbsoluteTime[];
         WriteString[stmp, InputForm[t1], "}"]; Close[stmp]; fileflag = False; n = 0;
         CreateDialog[
          Column[
           {Style["数据记录完毕", {Blue, 20}], "", Style[StringForm["记录总时间: `1`",
              NumberForm[t1 - t0, {8, 1}]], {Blue, 20}]}]]]
      , ImageSize → 85]}, Spacer[8]]},
    {Null},
```

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      {Row[{"数据文件:",
         Framed@InputField[Dynamic[directoryout], String, FieldSize → 23],
         FileNameSetter[Dynamic[directoryout]]}, Spacer[3]],
       Button["周期分析", Quiet@processFenxi[directoryout]]}},
     Frame → {All, {False, False,
        {False, True}, False, False, {True, False}}}, FrameStyle → Blue]}, Spacer[22]],
  ControlPlacement → Bottom],
 Initialization :→ (n = 160; m = 120; start = False; jiankong = False;
   u = {0}; dynamiczuobiao = {160, 120};
   α = s1 = s2 = Null; k = 30; fileflag = False; savestart = False; nn = 0;
   directoryin = directoryout = Null; directoryin = "C:\\";
   processM[img_, start_, zuobiao0_: {-1, -1}, L_: 240, l_: 320] := Module[{},
If[start, dynamiczuobiao = graygetzuobiao1[img, L, l]; Show[img, Graphics[
{{Blue, Line[{{0, dynamiczuobiao[[2]]}, {l, dynamiczuobiao[[2]]}}],
Line[{{dynamiczuobiao[[1]], 0}, {dynamiczuobiao[[1]], L}}]},
{Red, Dashed, Line[{{0, zuobiao0[[2]]}, {l, zuobiao0[[2]]}}],
Line[{{zuobiao0[[1]], 0}, {zuobiao0[[1]], L}}]}}]],
Show[img,
       Graphics[{Red, Dashed, Line[{{0, zuobiao0[[2]]}, {l, zuobiao0[[2]]}}],
Line[{{zuobiao0[[1]], 0}, {zuobiao0[[1]], L}}]}]]]];
   processCh[zuobiao0_, zuobiaot_, k_, s1_, s2_, α_] :=
Module[{l, h, jiao      }, l = Norm[zuobiaot - zuobiao0] / k;
h = s1 + s2 Tan[α / 180 π]; jiao = 1 / 2 ArcTan[l / h] 180 / π × 60;
     If[Length[u] < 50, u = Append[u, jiao], u = Drop[u, 1]; u = Append[u, jiao]];
Show[ListLinePlot[u, PlotStyle -> Red, PlotRange -> {{0, 50}, {0, 180}}, Frame -> True,
AspectRatio -> 0.4,
Background -> GrayLevel[0.3],
       PlotLabel -> Style["实时监控曲线", {RGBColor[1, 0, 1], 15}]],
Graphics[{
Text[Style[
          StringForm["当前偏角: `1` 分", NumberForm[N[jiao], {3, 2}]], {Green, 20}],
Scaled[{0.6, 0.9}], {-1, 0}], Text[Style[DateString[], {Blue, 20}],
         Scaled[{0.1, 0.9}], {-1, 0}]
}], ImageSize -> 575]];
   graygetzuobiao1[img_, L_: 240, l_: 320] := Module[{data, max = 0, zuobiao, k},
data = ImageData[ColorConvert[img, "Grayscale"]];
If[Length[data[[1, 1]]] == 0,
Do[k = data[[m, n]];
       If[k > max, max = k; zuobiao = {n - 1, L - m}], {m, 1, L}, {n, 1, l}],
Do[k = data[[m, n, 1]]; If[k > max, max = k; zuobiao = {n - 1, L - m}], {m, 1, L}, {n, 1, l}]];
Return[zuobiao];];
   processSave[stmp_, t0_, zuobiao0_,
     zuobiaot_, k_, s1_, s2_, α_] := Module[{l, h, jiao },
l = Norm[zuobiaot - zuobiao0] / k; h = s1 + s2 Tan[α / 180 π];
     jiao = 1 / 2 ArcTan[l / h] 180 / π × 60;
If[AbsoluteTime[] > t0,
      WriteString[stmp, "{", ToString@NumberForm[AbsoluteTime[] - t0, {10, 2}], ","
 , ToString@NumberForm[N[jiao], {5, 2}], "}", ","]]];
 processFenxi[directoryout_] := Module[{stmpout, indata, tim0, tim1 , data = {} , l},
stmpout = OpenRead[directoryout]; indata = ReadList[stmpout, Expression][[1]];
Close[stmpout]; tim0 = indata[[1]]; tim1 = indata[[-1]]; l = Length[indata];
Do[data = Append[data, {tim0 + indata[[i, 1]], indata[[i, 2]]}], {i, 2, l - 1}];
CreateDialog[Panel[Column[{
Column[{Row[
```

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                {"", Style["开始时间:", {20, Blue}], Style[DateString[tim0], {20, Blue}]},
                Spacer[10]],
Row[
                {"", Style["结束时间:", {20, Blue}], Style[DateString[tim1], {20, Blue}]},
                Spacer[10]]}], "",
DateListPlot[data, ImageSize → 600,
           AspectRatio → 0.4, Joined → True, PlotRange → {0, 180}
, PlotLabel → Style["偏角—时间曲线", 20]]
}], Background → White]]
];)]
```

Out[6]=


镜屏距离：
镜镜距离：
旋转角度：
数据记录与周期分析
存储位置：
C：\
浏览...
建立文件流
未开始监控
开始记录
停止记录
数据文件：
浏览...
周期分析