In[5]:=
```
Framed@Panel[Manipulate[Row[{Framed@Show[img1, ImageSize → 400],
    Framed@Show[img2, ImageSize → 400]}, Spacer[20]],
   Item[Row[{"", Style["折 射 率 自 动 化 测 量 程 序", {Red, 25}], ""},
    Spacer[259]], ControlPlacement → Top],
   Delimiter,
   Item["", ControlPlacement → Top],
   Item[Row[{"", Row[
     {Dynamic@Setter[Dynamic[yeorgu], True, If[yeorgu, Style[" 固体 ", {Blue, 15}],
        Style[" 固体 ", {GrayLevel[0.5], 15}]],
       Alignment → Center, ImageSize → {100, 25}],
      Dynamic@Setter[Dynamic[yeorgu], False, If[! yeorgu,
        Style[" 液体 ", {Blue, 15}],
        Style[" 液体 ", {GrayLevel[0.5], 15}]], Alignment → Center,
       ImageSize → {100, 25}]},
     Spacer[20]] , "", Row[{Button["检查CCD", CreateDialog[CurrentImage[]],
      Method → "Queued",
      ImageSize → {130, 30}],
     Button["测前调整与k值的测量", CreateWindow[DialogNotebook[
       (Manipulate[Framed[Dynamic@Show[imgt, ImageSize → 400]],
        Item[Style["测前调整与k值的测量", {17, Blue}], ControlPlacement → Top],
        Delimiter,
        Item[Row[{"", Column[{Button[Style["拍摄"],
              imgt := CurrentImage[], 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], Initialization :> (imgt := CurrentImage[])])],
      WindowTitle -> "仪器调整与k值的侧量", WindowSize → All],
     Method → "Queued", ImageSize → {200, 30}]
    , ""}, Spacer[20]]}, Spacer[79]], ControlPlacement → Top], Item[
  Row[{"", Button["第一张照片", img1 = CurrentImage[], ImageSize → {200, 30}], "", "",
    Button["第二张照片", img2 = CurrentImage[], ImageSize → {200, 30}], ""},
```

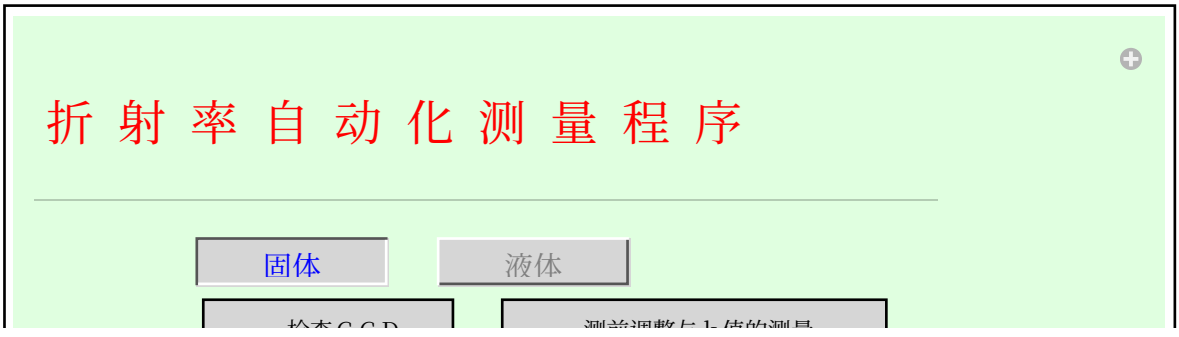
```
    Spacer[88]],
   ControlPlacement → Bottom],
  Delimiter,
  Item["", ControlPlacement → Bottom], Item[Row[{"", Grid[{{Row[{Dynamic@If[yeorgu,
          Style["器壁的折射率 n器壁", {GrayLevel[0.6], 15, Bold}],
          Style["器壁的折射率 n器壁", {15, Bold}]],
        Dynamic@InputField[Dynamic[ng], FieldSize → {20, 1.5}, Enabled → ! yeorgu]},
       Spacer[3]],
      Row[{Style["距离换算系数 k", {15, Bold}], InputField[
        Dynamic[k], FieldSize → {20, 1.5}]}, Spacer[3]]},
     {Row[{Style["镜面旋转角度 i", {15, Bold}], InputField[Dynamic[i],
        FieldSize → {20, 1.5}]}, Spacer[3]],
      Row[{Dynamic@If[yeorgu, Style["待测物体厚度 d", {15, Bold}],
        Style["容器内壁间距 d", {15, Bold}]],
       InputField[Dynamic[d], FieldSize → {20, 1.5}]}, Spacer[3]]}
    }, Alignment → Right, Spacings → {{0, 6, 4}, {2, 2, 2}}]}, Spacer[20]],
   ControlPlacement → Bottom],
  Delimiter, Item["", ControlPlacement → Bottom],
  Item[Row[{"", Dynamic@Button[
     If[flag, Style["计算", {Red, 15}], Style["正在计算...", {Red, 15}]],
     (flag = False;
      If[! (i === Null) && ! (d === Null) && k > 0, timg1 = img1; img1 = Module[{p},
        p = graygetzuobiao1[timg1]; Show[timg1,
         Graphics[{Red, Line[{{0, p[[2]]}, {320, p[[2]]}}],
           Line[{{p[[1]], 0}, {p[[1]], 240}}]}]]]; timg2 = img2; img2 = Module[{p},
        p = graygetzuobiao1[timg2];
        Show[timg2, Graphics[{Red, Line[{{0, p[[2]]}, {320, p[[2]]}}],
           Line[{{p[[1]], 0}, {p[[1]], 240}}]}]]];
       CreateDialog[Dynamic[Panel[If[yeorgu,
          jisuangu[img1, img2, i, d, k], jisuanye[img1, img2, ng, i, d, k]],
         Background -> White], Deinitialization :> (img1 = timg1; img2 = timg2)]
        , Modal -> True, WindowTitle → "计算结果"],
       CreateDialog[Panel[Style["没有输入数据", {20, Red}], Background → White]]];
      flag = True), Method → "Queued", ImageSize → {200, 30}], "", "",
   Button[Style["清空", {Red, 15}],
    img1 = img2 = Image[Table[0, {240}, {320}]]; d = i = Null;
    , ImageSize → {200, 30}], ""}, Spacer[88]], ControlPlacement → Bottom],

  Initialization :> (
    i = d = ng = Null; k = 43.5; flag = True; yeorgu = True;

    img1 = img2 = Image[Table[0, {240}, {320}]];
    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];
];
    jisuangu[img1_, img2_, α_, d_, k_] :=
```

```
Module[{p1, p2, xl},
 p1 = graygetzuobiao1[img1];
 p2 = graygetzuobiao1[img2];
 xl = Norm[p1 - p2]/k;
 Grid[{{Style["计算结果:", {Blue, 20}], SpanFromLeft},
   {Style["光斑位移x", 15], StringForm["`1` 厘米", NumberForm[N[xl], {3, 2}]]},
   {Style["镜面旋转角度i", 15], StringForm["`1` 度", α]},
   {Style["待测物体厚度d", 15], StringForm["`1` 厘米", d]},
   {Style["所测固体折射率n", {15, Red}],
    Style[N[Sqrt[Sin[π/2 - πα/90]^2 + Cos[π/2 - πα/90]^2/(1 - xl/d)^2]], {Red, 15}]}
  }, Frame → All]];

jisuanye[img1_, img2_, ng_, α_, d_, k_] :=
 Module[{p1, p2, xl},
  p1 = graygetzuobiao1[img1];
  p2 = graygetzuobiao1[img2];
  xl = Norm[p1 - p2]/k;
  Grid[{
    {Style["计算结果: ", {Blue, 20}], SpanFromLeft},
    {Style["光斑位移x", 15], StringForm["`1` 厘米", NumberForm[N[xl], {3, 2}]]},
    {Style["镜面旋转角度i", 15], StringForm["`1` 度", α]},
    {Style["容器内壁间距d", 15], StringForm["`1` 厘米", d]},
    {Style["器壁折射率n器壁", 15], StringForm["`1`", N[ng]]},
    {Style["所测液体折射率n", {Red, 15}],
     Style[Sqrt[Sin[π/2 - πα/90]^2/ng^2 + Cos[π/2 - πα/90]^2/(ng^2 (1 - xl/d)^2)], {Red, 15}]}},
   Frame → All]]
, Paneled → False], Background → LightGreen]
```



检查CCD　　测前调整与K值的测量

Out[5]=

第一张照片

第二张照片

器壁的折射率 $n_{器壁}$

距离换算系数 k

43.5

镜面旋转角度 i

待测物体厚度 d