

## Geometric Alignment for the Liquid Surface Spectrometer

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### SPEC Cheat Sheet for the Geometric Alignment of the Liquid Surface Spectrometer

(Align the beam to be parallel with the surface of the sample and determine g<sub>11</sub>, g<sub>12</sub> and g<sub>13</sub>)

#### A) Alignment for g<sub>11</sub>

- a. SURF> g\_trck=0;pa (to disable oh or sh)
- b. SURF>s1v 0.01 0.01,s1h 1.5 1.5
- c. SURF>DET=monc; plotselect monc
- d. SURF>umk 0 0 0
- e. SURF>dscan ih -0.3 0.3 20 1
- f. SURF>umv ih CEN;set ih 0
- g. SURF>umk 0 0 0.05
- h. SURF>dscan iscan -0.5 0.5 20 1
- i. SURF>umk 0 0 0.1
- j. SURF>dscan iscan -0.5 0.5 20 1
- k. ...continue (Repeat the iscan to an angle as far as your experiment requires.)
- l. SURF> g\_trck=1;pa (enable oh or sh)
- m. Use IDL to obtain g<sub>11</sub> value (see IDL cheat sheet), input g<sub>11</sub> in SPEC, and then check the alignment at a few angles.

#### B) Zero\_angle procedure

- a. (mv sh to cut incident intensity by 1/2 and set sh 0)
- b. SURF>s1v 0.01 0.01; s1h 1.5 1.5;s2v 1 1;s2h 2 2;s3v 1 1;s3h 2 2
- c. SURF>DET=det;plotselect det
- d. SURF>abs 41
- e. SURF>umv sh -2
- f. SURF>dscan oh -1.5 1.5 20 1
- g. SURF>umv oh CEN;set oh 0
- h. SURF>umi 0.35 0.35
- i. SURF>wh
- j. SURF>abs 20
- k. SURF>shscan 0.4 20 1
- l. SURF>umv sh CEN; set sh NOM
- m. SURF>dscan oh -1.5 1.5 20 1
- n. SURF>abs 40
- o. SURF>zero\_angle
- p. Record mi value on the screen to note the correction for alpha.
- q. Repeat from a) to n)

#### C) Alignment for g<sub>12</sub> and g<sub>13</sub>

- a. SURF>s1v 0.01 0.01; s1h 1.5 1.5;s2v 1 1;s2h 2 2;s3v 1 1;s3h 2 2
- b. SURF>DET=det;plotselect det
- c. SURF>abs 41
- d. SURF>umi 0 0
- e. SURF>umv sh -1
- f. SURF>dscan oh -1.5 1.5 20 1
- g. SURF>umv oh CEN;set oh 0

## Liquid Surface X-ray Scattering User Help

- h. SURF>umk 0.35 0.35
  - i. SURF>wh
  - j. SURF>abs 20
  - k. SURF>shscan 0.7 20 1
  - l. SURF>umv sh CEN; set sh NOM
  - m. SURF>oscan 1.5 20 1
  - n. SURF>umi 1 1
  - o. SURF>wh
  - p. SURF>abs 10
  - q. SURF>shscan 1.2 20 1
  - r. SURF>umv sh CEN
  - s. SURF>oscan 1.57 20 1
  - t. SURF>umi 2 2
  - u. SURF>wh
  - v. SURF>abs 0
  - w. SURF>shscan 2.4 20 1
  - x. SURF>umv sh CEN
  - y. SURF>oscan 1.5 20 1
  - z. SURF>umi 3 3
  - aa. SURF>wh
  - bb. SURF>abs 0
  - cc. SURF>shscan 2.4 20 1
  - dd. SURF>umv sh CEN
  - ee. SURF>oscan 1.5 20 1
  - ff. Continue the measurements until shscan measurement is impossible.
  - gg. Use IDL to find g<sub>12</sub> and g<sub>13</sub> (see IDL cheat sheet), input them in SPEC, and then check the alignment at a few angles.
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