Geometric Alignment for the Liquid Surface Spectrometer

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 \( g_{l1}, g_{l2} \) and \( g_{l3} \))

A) Alignment for \( g_{l1} \)
\[ g_{l1} \]
\[ \text{(Align the beam to be parallel with the surface of the sample and determine } g_{l1}, g_{l2} \text{ and } g_{l3}) \]

a. \( \text{SURF> g_trck=0;pa (to disable oh or sh)} \)
b. \( \text{SURF>s1v 0.01 0.01,s1h 1.5 1.5} \)
c. \( \text{SURF>DET=monc; plotselect monc} \)
d. \( \text{SURF>umk 0 0 0} \)
e. \( \text{SURF>dscan ih –0.3 0.3 20 1} \)
f. \( \text{SURF>umv ih CEN;set ih 0} \)
g. \( \text{SURF>umk 0 0 0.05} \)
h. \( \text{SURF>dscan iscan –0.5 0.5 20 1} \)
i. \( \text{SURF>umk 0 0 0.1} \)
j. \( \text{SURF>dscan iscan –0.5 0.5 20 1} \)
k. \( \ldots \text{continue (Repeat the iscan to an angle as far as your experiment requires.)} \)
l. \( \text{SURF> g_trck=1;pa (enable oh or sh)} \)
m. \( \text{Use IDL to obtain } g_{l1} \text{ value (see IDL cheat sheet), input } g_{l1} \text{ in SPEC, and then check the alignment at a few angles.} \)

B) Zero_angle procedure
\[ \text{mv sh to cut incident intensity by } \frac{1}{2} \text{ and set sh 0} \]
\[ \text{(mv sh to cut incident intensity by } \frac{1}{2} \text{ and set sh 0)} \]
\[ \text{SURF>s1v 0.01 0.01,s1h 1.5 1.5,s2v 1 1,s2h 2 2,s3v 1 1,s3h 2 2} \]
\[ \text{SURF>DET=det;plotselect det} \]
\[ \text{SURF>abs 41} \]
\[ \text{SURF>umv sh -2} \]
\[ \text{SURF>dscan oh –1.5 1.5 20 1} \]
\[ \text{SURF>umv oh CEN;set oh 0} \]
\[ \text{SURF>umi 0.35 0.35} \]
\[ \text{SURF>wh} \]
\[ \text{SURF>abs 20} \]
\[ \text{SURF>shscan 0.4 20 1} \]
\[ \text{SURF>umv sh CEN; set sh NOM} \]
\[ \text{SURF>dscan oh -1.5 1.5 20 1} \]
\[ \text{SURF>abs 40} \]
\[ \text{SURF>zero_angle} \]
\[ \text{Record mi value on the screen to note the correction for alpha.} \]
\[ \text{Repeat from a) to n)} \]

C) Alignment for \( g_{l2} \) and \( g_{l3} \)
\[ \text{SURF>s1v 0.01 0.01,s1h 1.5 1.5,s2v 1 1,s2h 2 2,s3v 1 1,s3h 2 2} \]
\[ \text{SURF>DET=det;plotselect det} \]
\[ \text{SURF>abs 41} \]
\[ \text{SURF>umi 0 0} \]
\[ \text{SURF>umv sh -1} \]
\[ \text{SURF>dscan oh –1.5 1.5 20 1} \]
\[ \text{SURF>umv oh CEN;set oh 0} \]

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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
c. SURF>shscan 2.4 20 1
d. SURF>umv sh CEN
e. SURF>oscan 1.5 20 1
ff. Continue the measurements until shscan measurement is impossible.

gg. Use IDL to find g_12 and g_13 (see IDL cheat sheet), input them in SPEC, and then check the alignment at a few angles.