

Mechanical Survey

Per Hansson Adrian 6/25/2015

Positions

Survey – U-channels in Svt Box

U-channel positions

- L1-3 bot:
 - Vertically -5um
 - -120 (160)um off along length (width) of Svt box
- L1-3 top:
 - Vertically -30um
 - -60 (0)um off along length (width) of Svt box
- L4-6 top:
 - Vertically -40um
 - 60 (-30)um off along length (width) of Svt box
- L4-6 bot:
 - Vertically -10um
 - 30 (130)um off along length (width) of Svt box

Module support in U-channels

- L1-3 support:
 - Vertically: top high by $\sim 40\mu\text{m}$, bottom seems to have $20\mu\text{m}$ step b/w each?
 - Along U-channel: consistent to $\sim 60\mu\text{m}$
 - Along module: within $40\mu\text{m}$
- L4-6 support:
 - Vertically: top random within $\sim 40\mu\text{m}$, bottom same “step” as L1-3?
 - Along U-channel: top off by $+40\mu\text{m}$, bottom off by $-20\mu\text{m}$
 - Along module: bottom off from -40 to $-80\mu\text{m}$ in steps, top same steps but from $+50$ to $0\mu\text{m}$

Survey – Sensors in Module Support

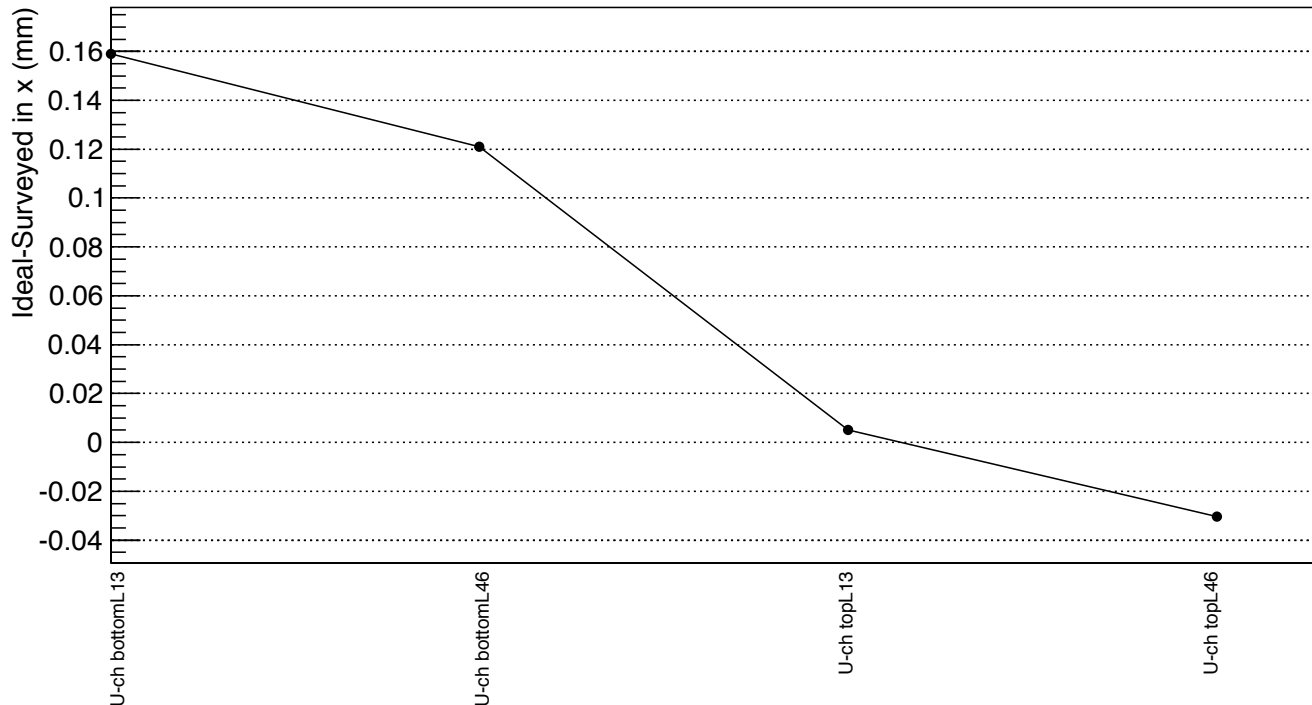
Sensor in module support

- L1-3:
 - Axial (stereo) sensors off by 10 (50)um vertically
 - Module thickness underestimated by 400um; consistent with old designer 3D model from Test run
 - Consistent 500um shift along strip direction for all sensors (not pinned down in fixture)
 - Rotations?
- L4-6:
 - Vertically: axial off by 30-40 consistently, stereo hole consistently 40um off w.r.t. stereo slot
 - Thickness to within 40um
 - 100um shift for all sensors along strip direction (not pinned down in fixture)

Survey – U-channel to Svt Box

U-ch bottomL13: -46.446, 241.18, -8.4230 -> -46.605, 241.30, -8.4175 (0.1590,-0.1200,-0.0055)
U-ch bottomL46: -5.8570, -157.78, -8.4230 -> -5.9779, -157.81, -8.4112 (0.1209,0.0300,-0.0118)
U-ch topL13: -46.930, 257.05, 8.4230 -> -46.935, 257.11, 8.4531 (0.0050,-0.0600,-0.0301)
U-ch topL46: -6.3410, -141.91, 8.4230 -> -6.3106, -141.97, 8.4620 (-0.0304,0.0600,-0.0390)

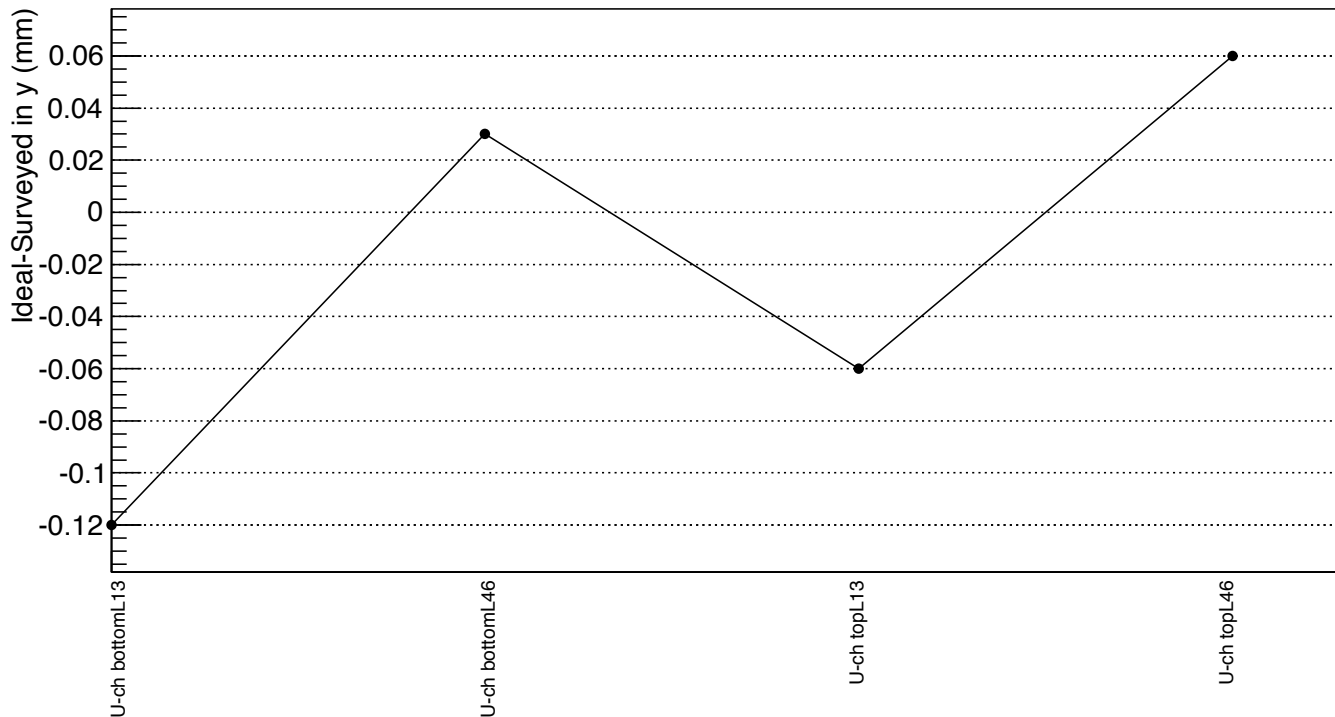
channelDiff-tmpSurv-UChannelToBoxOnly-vs-tmpDef survey



Survey – U-channel to Svt Box

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U-ch bottomL46: -5.8570, -157.78, -8.4230 -> -5.9779, -157.81, -8.4112 (0.1209,0.0300,-0.0118)
U-ch topL13: -46.930, 257.05, 8.4230 -> -46.935, 257.11, 8.4531 (0.0050,-0.0600,-0.0301)
U-ch topL46: -6.3410, -141.91, 8.4230 -> -6.3106, -141.97, 8.4620 (-0.0304,0.0600,-0.0390)

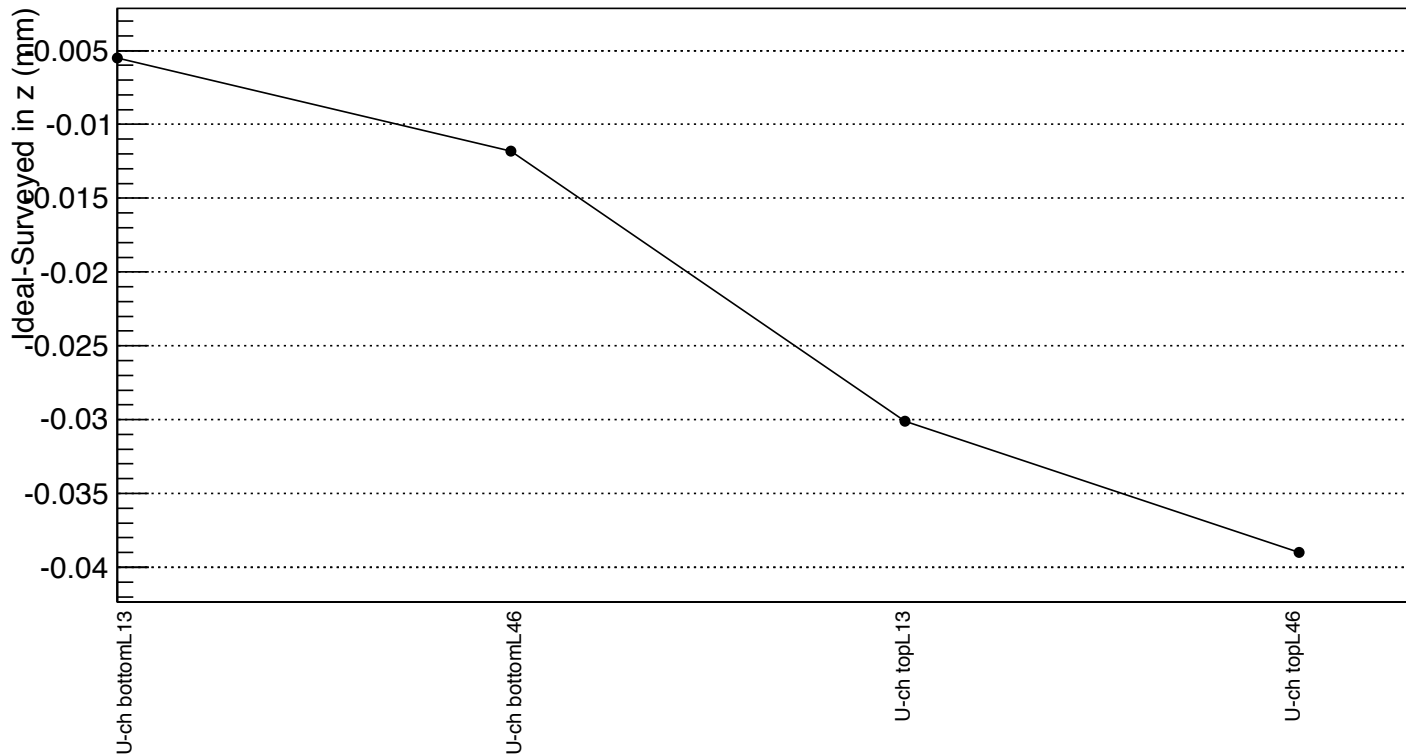
channelDiff-tmpSurv-UChannelToBoxOnly-vs-tmpDef survey



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U-ch bottomL46: -5.8570, -157.78, -8.4230 -> -5.9779, -157.81, -8.4112 (0.1209,0.0300,-0.0118)
U-ch topl13: -46.930, 257.05, 8.4230 -> -46.935, 257.11, 8.4531 (0.0050,-0.0600,-0.0301)

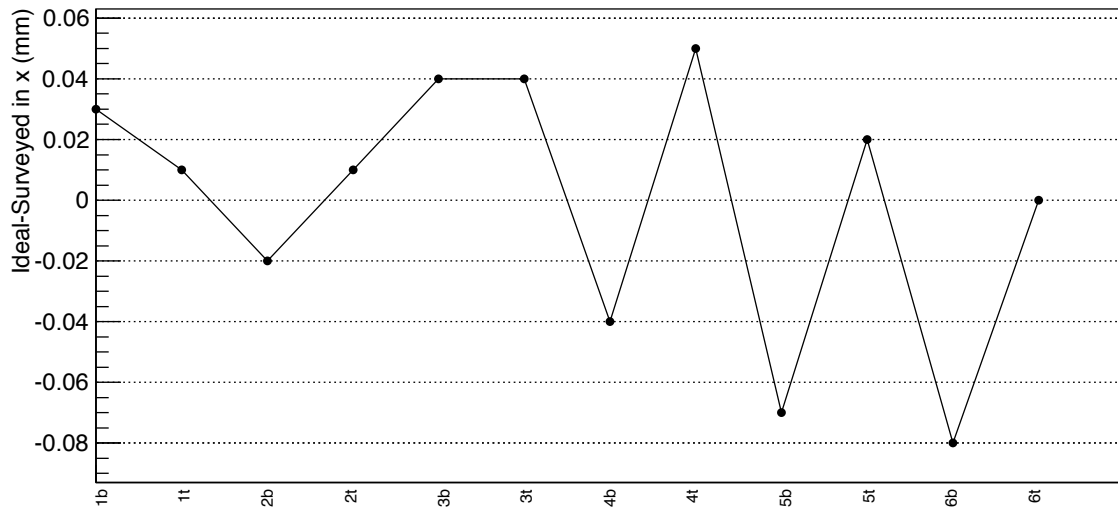
channelDiff-tmpSurv-UChannelToBoxOnly-vs-tmpDef survey



Survey – Module support to U-channel

1b:	-141.36,	228.75,	-59.858 ->	-141.39,	228.74,	-59.880 (0.0300,0.0100,0.0220)
1t:	-142.43,	263.67,	59.858 ->	-142.44,	263.68,	59.821 (0.0100,-0.0100,0.0370)
2b:	-138.31,	128.80,	-61.358 ->	-138.29,	128.74,	-61.359 (-0.0200,0.0600,0.0010)
2t:	-139.38,	163.72,	61.358 ->	-139.39,	163.78,	61.330 (0.0100,-0.0600,0.0280)
3b:	-135.25,	28.848,	-62.858 ->	-135.29,	28.783,	-62.839 (0.0400,0.0650,-0.0190)
3t:	-136.34,	63.767,	62.858 ->	-136.38,	63.758,	62.823 (0.0400,0.0090,0.0350)
4b:	-154.72,	-171.84,	-61.763 ->	-154.68,	-171.90,	-61.792 (-0.0400,0.0600,0.0290)
4t:	-155.79,	-136.94,	61.763 ->	-155.84,	-136.90,	61.721 (0.0500,-0.0400,0.0420)
5b:	-148.63,	-371.75,	-64.763 ->	-148.56,	-371.81,	-64.774 (-0.0700,0.0600,0.0110)
5t:	-149.69,	-336.84,	64.763 ->	-149.71,	-336.84,	64.776 (0.0200,0.0000,-0.0130)
6b:	-142.53,	-571.66,	-67.763 ->	-142.45,	-571.70,	-67.743 (-0.0800,0.0400,-0.0200)
6t:	-143.60,	-536.75,	67.763 ->	-143.60,	-536.72,	67.747 (0.0000,-0.0300,0.0160)

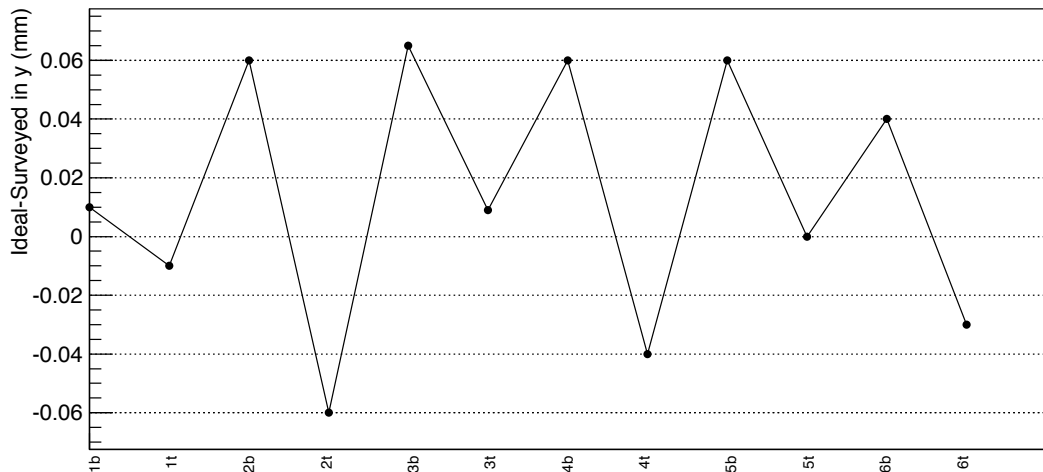
pinDiff-tmpSurv-ModuleToUChannelOnly-vs-tmpDef survey



Survey – Module support to U-channel

1b:	-141.36,	228.75,	-59.858 ->	-141.39,	228.74,	-59.880 (0.0300,0.0100,0.0220)
1t:	-142.43,	263.67,	59.858 ->	-142.44,	263.68,	59.821 (0.0100,-0.0100,0.0370)
2b:	-138.31,	128.80,	-61.358 ->	-138.29,	128.74,	-61.359 (-0.0200,0.0600,0.0010)
2t:	-139.38,	163.72,	61.358 ->	-139.39,	163.78,	61.330 (0.0100,-0.0600,0.0280)
3b:	-135.25,	28.848,	-62.858 ->	-135.29,	28.783,	-62.839 (0.0400,0.0650,-0.0190)
3t:	-136.34,	63.767,	62.858 ->	-136.38,	63.758,	62.823 (0.0400,0.0090,0.0350)
4b:	-154.72,	-171.84,	-61.763 ->	-154.68,	-171.90,	-61.792 (-0.0400,0.0600,0.0290)
4t:	-155.79,	-136.94,	61.763 ->	-155.84,	-136.90,	61.721 (0.0500,-0.0400,0.0420)
5b:	-148.63,	-371.75,	-64.763 ->	-148.56,	-371.81,	-64.774 (-0.0700,0.0600,0.0110)
5t:	-149.69,	-336.84,	64.763 ->	-149.71,	-336.84,	64.776 (0.0200,0.0000,-0.0130)
6b:	-142.53,	-571.66,	-67.763 ->	-142.45,	-571.70,	-67.743 (-0.0800,0.0400,-0.0200)
6t:	-143.60,	-536.75,	67.763 ->	-143.60,	-536.72,	67.747 (0.0000,-0.0300,0.0160)

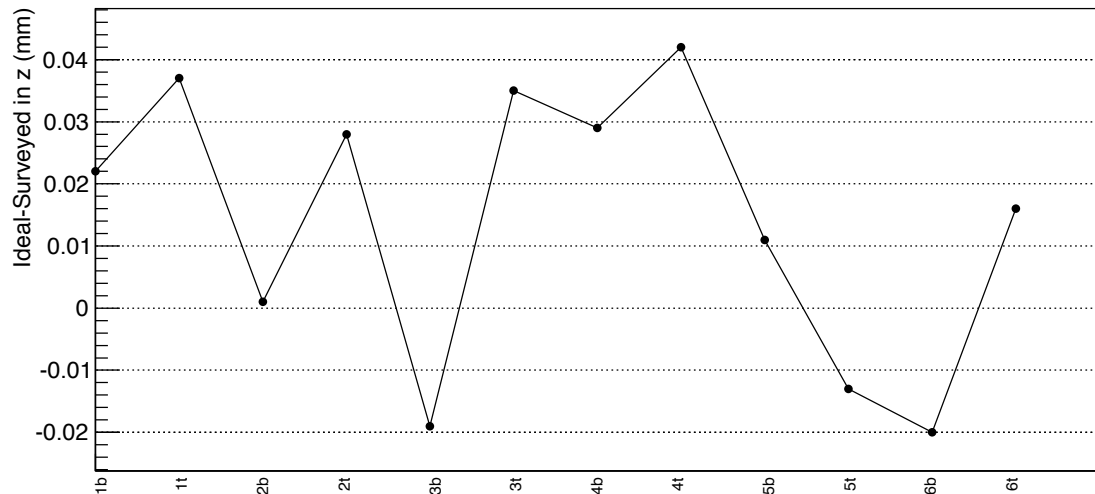
pinDiff-tmpSurv-ModuleToUChannelOnly-vs-tmpDef survey



Survey – Module support to U-channel

1b:	-141.36,	228.75,	-59.858 ->	-141.39,	228.74,	-59.880 (0.0300,0.0100,0.0220)
1t:	-142.43,	263.67,	59.858 ->	-142.44,	263.68,	59.821 (0.0100,-0.0100,0.0370)
2b:	-138.31,	128.80,	-61.358 ->	-138.29,	128.74,	-61.359 (-0.0200,0.0600,0.0010)
2t:	-139.38,	163.72,	61.358 ->	-139.39,	163.78,	61.330 (0.0100,-0.0600,0.0280)
3b:	-135.25,	28.848,	-62.858 ->	-135.29,	28.783,	-62.839 (0.0400,0.0650,-0.0190)
3t:	-136.34,	63.767,	62.858 ->	-136.38,	63.758,	62.823 (0.0400,0.0090,0.0350)
4b:	-154.72,	-171.84,	-61.763 ->	-154.68,	-171.90,	-61.792 (-0.0400,0.0600,0.0290)
4t:	-155.79,	-136.94,	61.763 ->	-155.84,	-136.90,	61.721 (0.0500,-0.0400,0.0420)
5b:	-148.63,	-371.75,	-64.763 ->	-148.56,	-371.81,	-64.774 (-0.0700,0.0600,0.0110)
5t:	-149.69,	-336.84,	64.763 ->	-149.71,	-336.84,	64.776 (0.0200,0.0000,-0.0130)
6b:	-142.53,	-571.66,	-67.763 ->	-142.45,	-571.70,	-67.743 (-0.0800,0.0400,-0.0200)
6t:	-143.60,	-536.75,	67.763 ->	-143.60,	-536.72,	67.747 (0.0000,-0.0300,0.0160)

pinDiff-tmpSurv-ModuleToUChannelOnly-vs-tmpDef survey

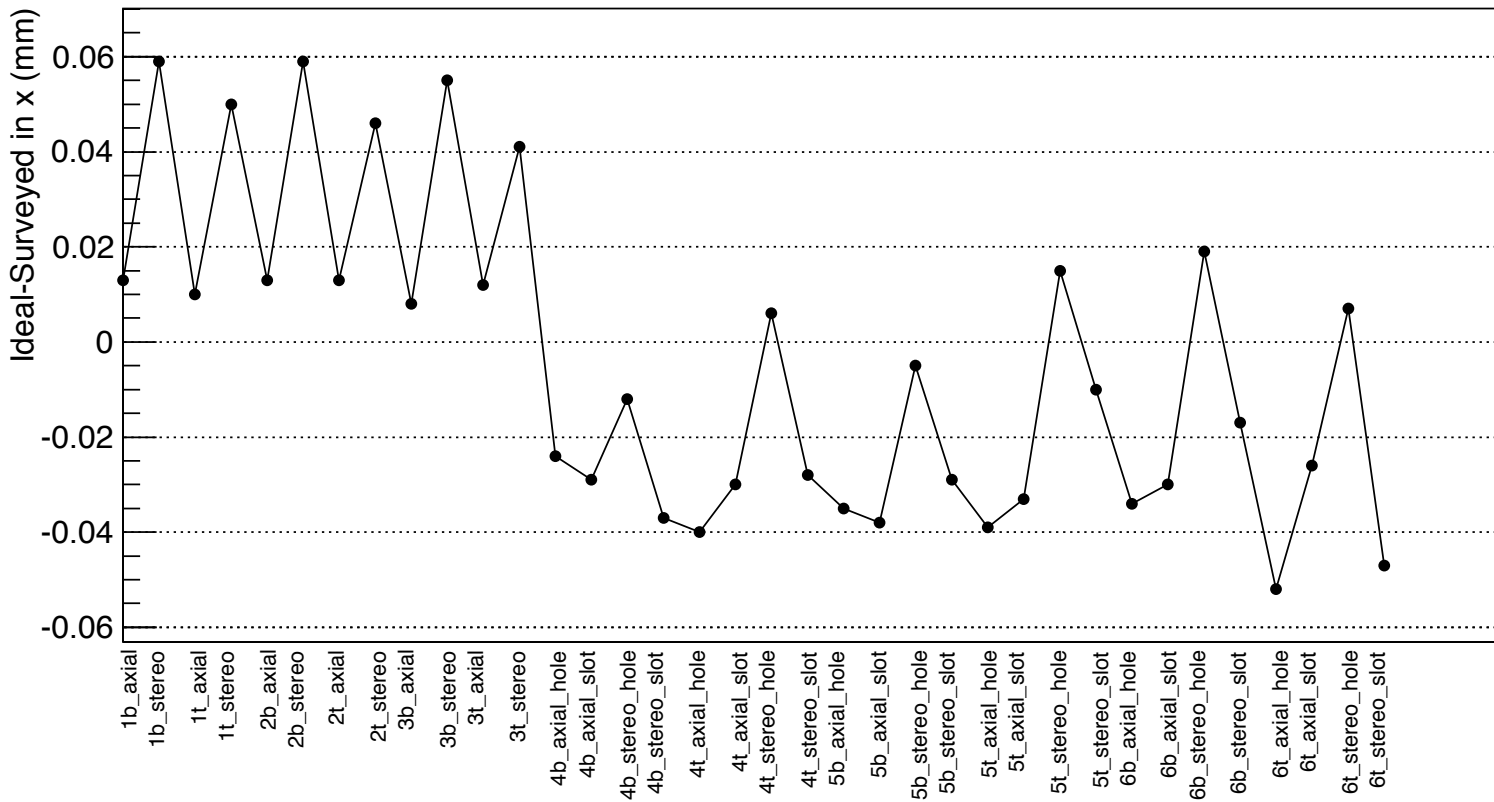


Survey – Sensor in Module Support

1b_axial: -39.192, 123.65, -5.8420 -> -39.205, 124.21, -5.5944 (0.0130,-0.5600,-0.2476)
1b_stereo: -39.192, 123.65, -13.208 -> -39.251, 124.16, -13.660 (0.0590,-0.5100,0.4520)
1t_axial: -39.192, 123.65, -5.8420 -> -39.202, 124.08, -5.4900 (0.0100,-0.4300,-0.3520)
1t_stereo: -39.192, 123.65, -13.208 -> -39.242, 124.13, -13.680 (0.0500,-0.4800,0.4720)
2b_axial: -39.192, 123.65, -5.8420 -> -39.205, 124.12, -5.4189 (0.0130,-0.4700,-0.4231)
2b_stereo: -39.192, 123.65, -13.208 -> -39.251, 124.26, -13.473 (0.0590,-0.6100,0.2650)
2t_axial: -39.192, 123.65, -5.8420 -> -39.205, 124.08, -5.6159 (0.0130,-0.4300,-0.2261)
2t_stereo: -39.192, 123.65, -13.208 -> -39.238, 124.07, -13.616 (0.0460,-0.4200,0.4080)
3b_axial: -39.192, 123.65, -5.8420 -> -39.200, 124.09, -5.6042 (0.0080,-0.4400,-0.2378)
3b_stereo: -39.192, 123.65, -13.208 -> -39.247, 124.10, -13.475 (0.0550,-0.4500,0.2670)
3t_axial: -39.192, 123.65, -5.8420 -> -39.204, 124.07, -5.5975 (0.0120,-0.4200,-0.2445)
3t_stereo: -39.192, 123.65, -13.208 -> -39.233, 124.07, -13.589 (0.0410,-0.4200,0.3810)
4b_axial_hole: -35.103, 98.730, -5.8420 -> -35.079, 98.850, -5.7514 (-0.0240,-0.1200,-0.0906)
4b_axial_slot: -35.103, 199.72, -5.8420 -> -35.074, 199.70, -5.7511 (-0.0290,0.0200,-0.0909)
4b_stereo_hole: -32.563, 98.781, -13.208 -> -32.551, 98.840, -13.259 (-0.0120,-0.0590,0.0510)
4b_stereo_slot: -37.617, 199.67, -13.208 -> -37.580, 199.76, -13.256 (-0.0370,-0.0900,0.0480)
4t_axial_hole: -35.103, 98.730, -5.8420 -> -35.063, 98.873, -5.7833 (-0.0400,-0.1430,-0.0587)
4t_axial_slot: -35.103, 199.72, -5.8420 -> -35.073, 199.80, -5.7063 (-0.0300,-0.0800,-0.1357)
4t_stereo_hole: -32.563, 98.781, -13.208 -> -32.569, 98.941, -13.255 (0.0060,-0.1600,0.0470)
4t_stereo_slot: -37.617, 199.67, -13.208 -> -37.589, 199.74, -13.190 (-0.0280,-0.0700,-0.0180)
5b_axial_hole: -35.103, 98.730, -5.8420 -> -35.068, 98.807, -5.6851 (-0.0350,-0.0770,-0.1569)
5b_axial_slot: -35.103, 199.72, -5.8420 -> -35.065, 199.73, -5.6756 (-0.0380,-0.0100,-0.1664)
5b_stereo_hole: -32.563, 98.781, -13.208 -> -32.558, 98.872, -13.286 (-0.0050,-0.0910,0.0780)
5b_stereo_slot: -37.617, 199.67, -13.208 -> -37.588, 199.71, -13.283 (-0.0290,-0.0400,0.0750)
5t_axial_hole: -35.103, 98.730, -5.8420 -> -35.064, 98.847, -5.6994 (-0.0390,-0.1170,-0.1426)
5t_axial_slot: -35.103, 199.72, -5.8420 -> -35.070, 199.73, -5.6592 (-0.0330,-0.0100,-0.1828)
5t_stereo_hole: -32.563, 98.781, -13.208 -> -32.578, 98.970, -13.315 (0.0150,-0.1890,0.1070)
5t_stereo_slot: -37.617, 199.67, -13.208 -> -37.607, 199.79, -13.233 (-0.0100,-0.1200,0.0250)
6b_axial_hole: -35.103, 98.730, -5.8420 -> -35.069, 98.822, -5.7311 (-0.0340,-0.0920,-0.1109)
6b_axial_slot: -35.103, 199.72, -5.8420 -> -35.073, 199.75, -5.5877 (-0.0300,-0.0300,-0.2543)
6b_stereo_hole: -32.563, 98.781, -13.208 -> -32.582, 98.965, -13.275 (0.0190,-0.1840,0.0670)
6b_stereo_slot: -37.617, 199.67, -13.208 -> -37.600, 199.76, -13.230 (-0.0170,-0.0900,0.0220)
6t_axial_hole: -35.103, 98.730, -5.8420 -> -35.051, 98.965, -5.8049 (-0.0520,-0.2350,-0.0371)
6t_axial_slot: -35.103, 199.72, -5.8420 -> -35.077, 199.74, -5.8627 (-0.0260,-0.0200,0.0207)
6t_stereo_hole: -32.563, 98.781, -13.208 -> -32.570, 99.088, -13.266 (0.0070,-0.3070,0.0580)
6t_stereo_slot: -37.617, 199.67, -13.208 -> -37.570, 199.76, -13.292 (-0.0470,-0.0900,0.0840)

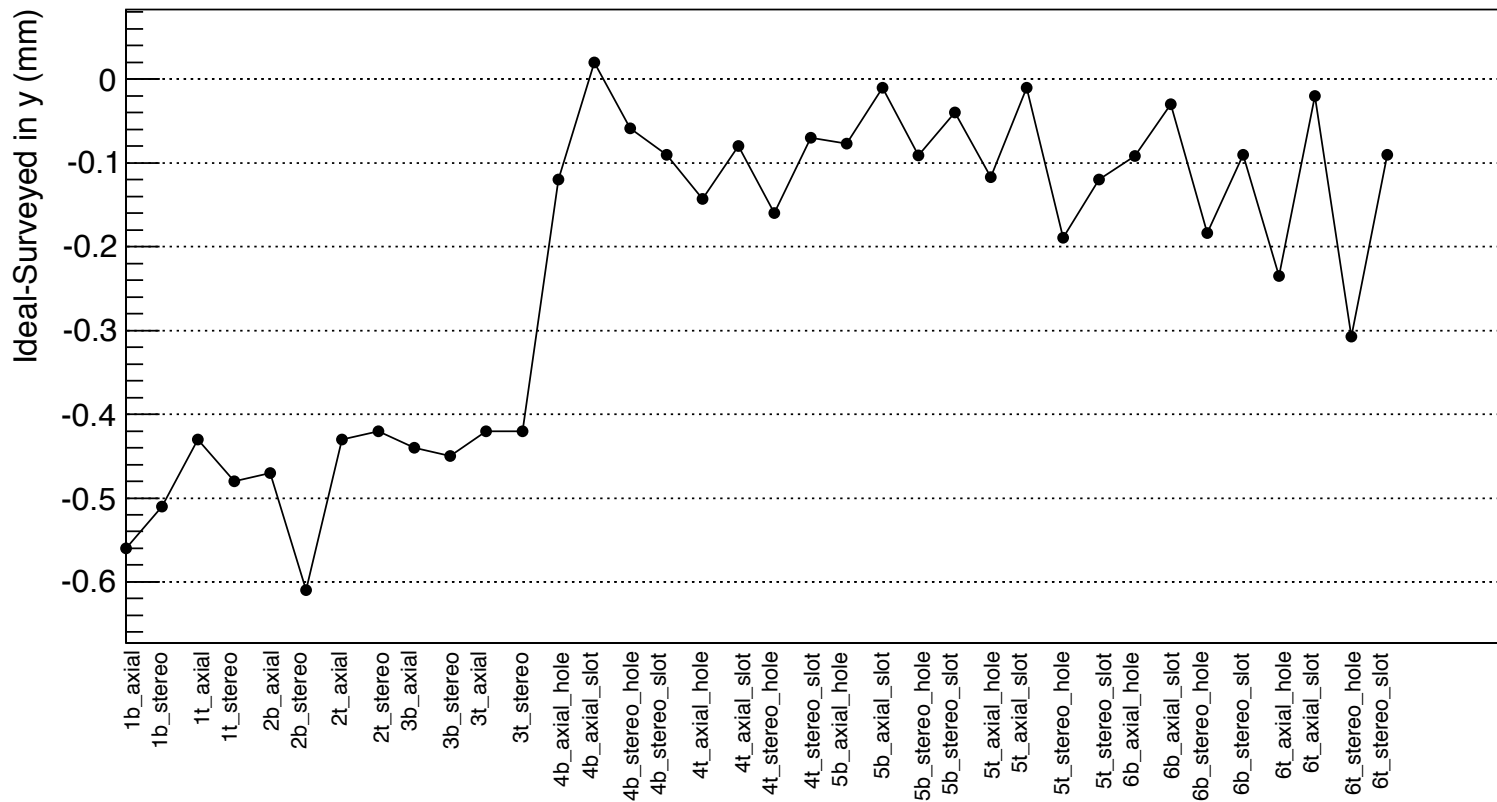
Survey – Sensor in Module Support

sensorDiff-tmpSurv-SensorToModuleOnly-vs-tmpDef survey



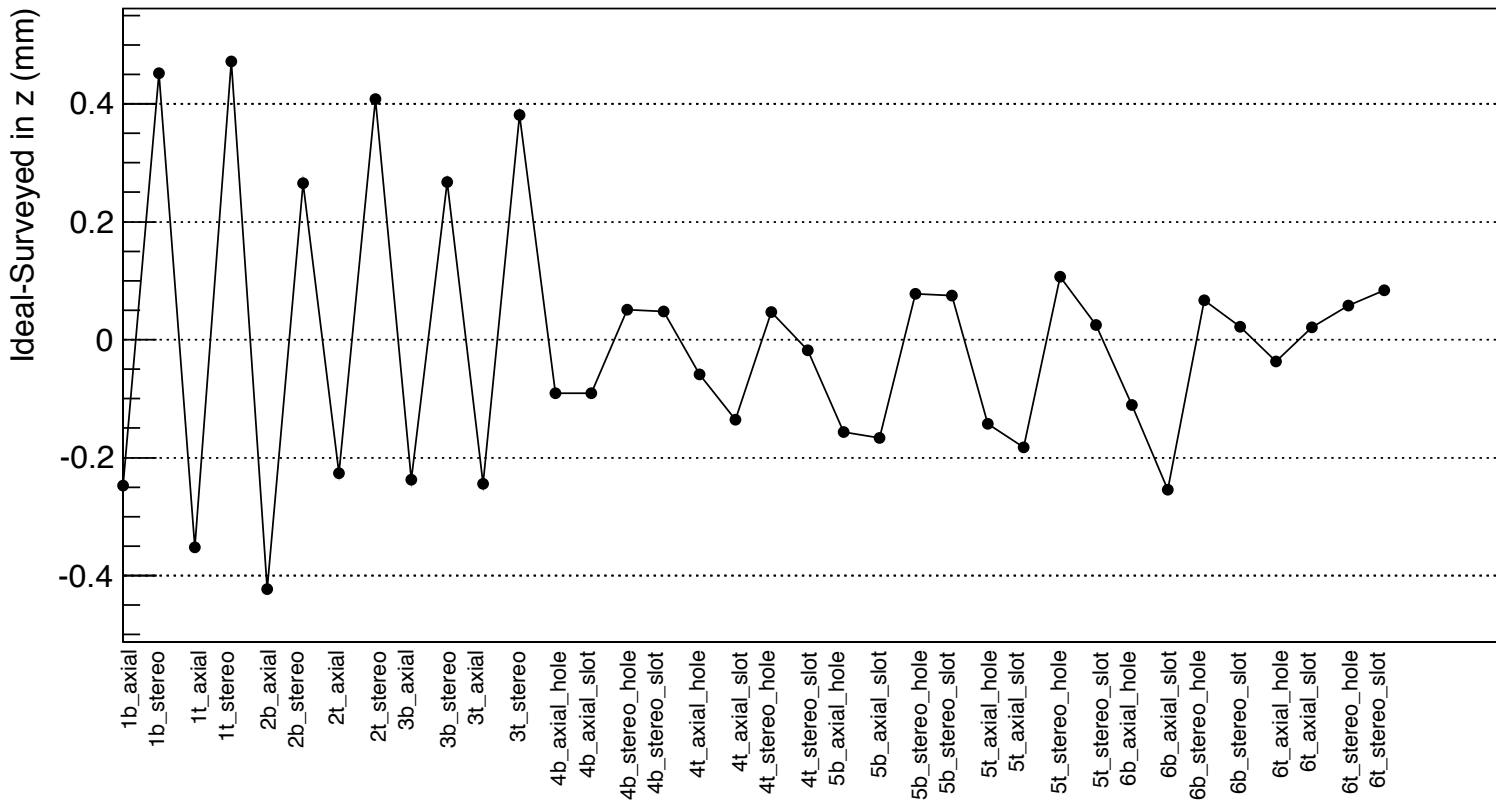
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sensorDiff-tmpSurv-SensorToModuleOnly-vs-tmpDef survey



Survey – Sensor in Module Support

sensorDiff-tmpSurv-SensorToModuleOnly-vs-tmpDef survey

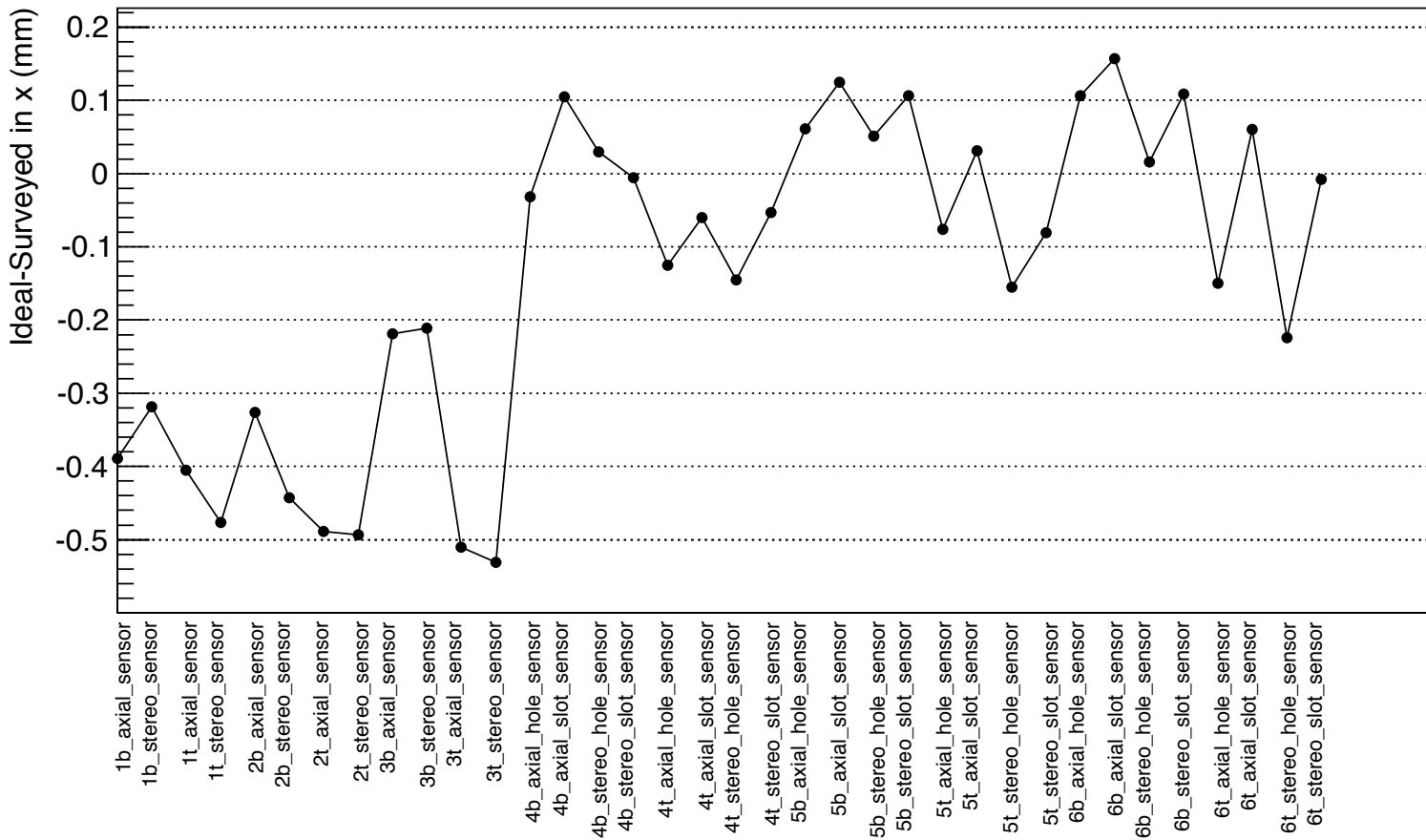


Survey – Sensor in global

1b_axial_sensor:	3.3864,	-20.666,	111.57 ->	3.7752,	-20.659,	111.75 (-0.3888,-0.0070,-0.1800)
1b_stereo_sensor:	3.1615,	-20.666,	104.20 ->	3.4801,	-20.608,	103.69 (-0.3186,-0.0580,0.5100)
1t_axial_sensor:	2.6780,	20.666,	88.338 ->	3.0832,	20.648,	87.909 (-0.4052,0.0180,0.4290)
1t_stereo_sensor:	2.9021,	20.666,	95.701 ->	3.3785,	20.611,	96.094 (-0.4764,0.0550,-0.3930)
2b_axial_sensor:	6.4400,	-22.166,	211.52 ->	6.7661,	-22.164,	211.87 (-0.3261,-0.0020,-0.3500)
2b_stereo_sensor:	6.2151,	-22.166,	204.16 ->	6.6575,	-22.117,	203.81 (-0.4424,-0.0490,0.3500)
2t_axial_sensor:	5.7208,	22.166,	188.29 ->	6.2095,	22.198,	187.98 (-0.4887,-0.0320,0.3100)
2t_stereo_sensor:	5.9450,	22.166,	195.65 ->	6.4382,	22.168,	195.98 (-0.4932,-0.0020,-0.3300)
3b_axial_sensor:	9.4936,	-23.666,	311.47 ->	9.7121,	-23.644,	311.63 (-0.2185,-0.0220,-0.1600)
3b_stereo_sensor:	9.2686,	-23.666,	304.11 ->	9.4799,	-23.600,	303.76 (-0.2113,-0.0660,0.3500)
3t_axial_sensor:	8.7637,	23.666,	288.25 ->	9.2741,	23.719,	287.96 (-0.5104,-0.0530,0.2900)
3t_stereo_sensor:	8.9878,	23.666,	295.61 ->	9.5189,	23.692,	295.95 (-0.5311,-0.0260,-0.3400)
4b_axial_hole_sensor:	-34.880,	-26.660,	512.93 ->	-34.848,	-26.685,	513.08 (-0.0320,0.0250,-0.1500)
4b_axial_slot_sensor:	66.063,	-26.660,	509.85 ->	65.958,	-26.686,	510.03 (0.1050,0.0260,-0.1800)
4b_stereo_hole_sensor:	-35.054,	-29.200,	505.57 ->	-35.084,	-29.212,	505.57 (0.0300,0.0120,0.0000)
4b_stereo_slot_sensor:	65.788,	-24.146,	502.49 ->	65.794,	-24.180,	502.52 (-0.0060,0.0340,-0.0300)
4t_axial_hole_sensor:	-35.589,	26.660,	489.70 ->	-35.464,	26.711,	489.65 (-0.1250,-0.0510,0.0500)
4t_axial_slot_sensor:	65.354,	26.660,	486.62 ->	65.414,	26.721,	486.51 (-0.0600,-0.0610,0.1100)
4t_stereo_hole_sensor:	-35.314,	29.200,	497.06 ->	-35.169,	29.210,	497.12 (-0.1450,-0.0100,-0.0600)
4t_stereo_slot_sensor:	65.528,	24.146,	493.99 ->	65.581,	24.211,	493.99 (-0.0530,-0.0650,0.0000)
5b_axial_hole_sensor:	-28.785,	-29.660,	712.84 ->	-28.846,	-29.678,	713.07 (0.0610,0.0180,-0.2300)
5b_axial_slot_sensor:	72.159,	-29.660,	709.76 ->	72.034,	-29.683,	710.03 (0.1250,0.0230,-0.2700)
5b_stereo_hole_sensor:	-28.959,	-32.200,	705.48 ->	-29.010,	-32.189,	705.47 (0.0510,-0.0110,0.0100)
5b_stereo_slot_sensor:	71.883,	-27.146,	702.40 ->	71.777,	-27.160,	702.43 (0.1060,0.0140,-0.0300)
5t_axial_hole_sensor:	-29.493,	29.660,	689.61 ->	-29.417,	29.761,	689.48 (-0.0760,-0.1010,0.1300)
5t_axial_slot_sensor:	71.450,	29.660,	686.53 ->	71.419,	29.783,	686.37 (0.0310,-0.1230,0.1600)
5t_stereo_hole_sensor:	-29.218,	32.200,	696.97 ->	-29.063,	32.249,	697.09 (-0.1550,-0.0490,-0.1200)
5t_stereo_slot_sensor:	71.624,	27.146,	693.90 ->	71.705,	27.248,	693.94 (-0.0810,-0.1020,-0.0400)
6b_axial_hole_sensor:	-22.689,	-32.660,	912.75 ->	-22.795,	-32.655,	912.89 (0.1060,-0.0050,-0.1400)
6b_axial_slot_sensor:	78.254,	-32.660,	909.67 ->	78.097,	-32.665,	909.99 (0.1570,0.0050,-0.3200)
6b_stereo_hole_sensor:	-22.863,	-35.200,	905.38 ->	-22.879,	-35.145,	905.35 (0.0160,-0.0550,0.0300)
6b_stereo_slot_sensor:	77.979,	-30.146,	902.31 ->	77.870,	-30.140,	902.35 (0.1090,-0.0060,-0.0400)
6t_axial_hole_sensor:	-23.398,	32.660,	889.52 ->	-23.248,	32.722,	889.46 (-0.1500,-0.0620,0.0600)
6t_axial_slot_sensor:	77.546,	32.660,	886.44 ->	77.486,	32.709,	886.45 (0.0600,-0.0490,-0.0100)
6t_stereo_hole_sensor:	-23.122,	35.200,	896.88 ->	-22.898,	35.200,	896.91 (-0.2240,0.0000,-0.0300)
6t_stereo_slot_sensor:	77.720,	30.146,	893.80 ->	77.728,	30.212,	893.88 (-0.0080,-0.0660,-0.0800)

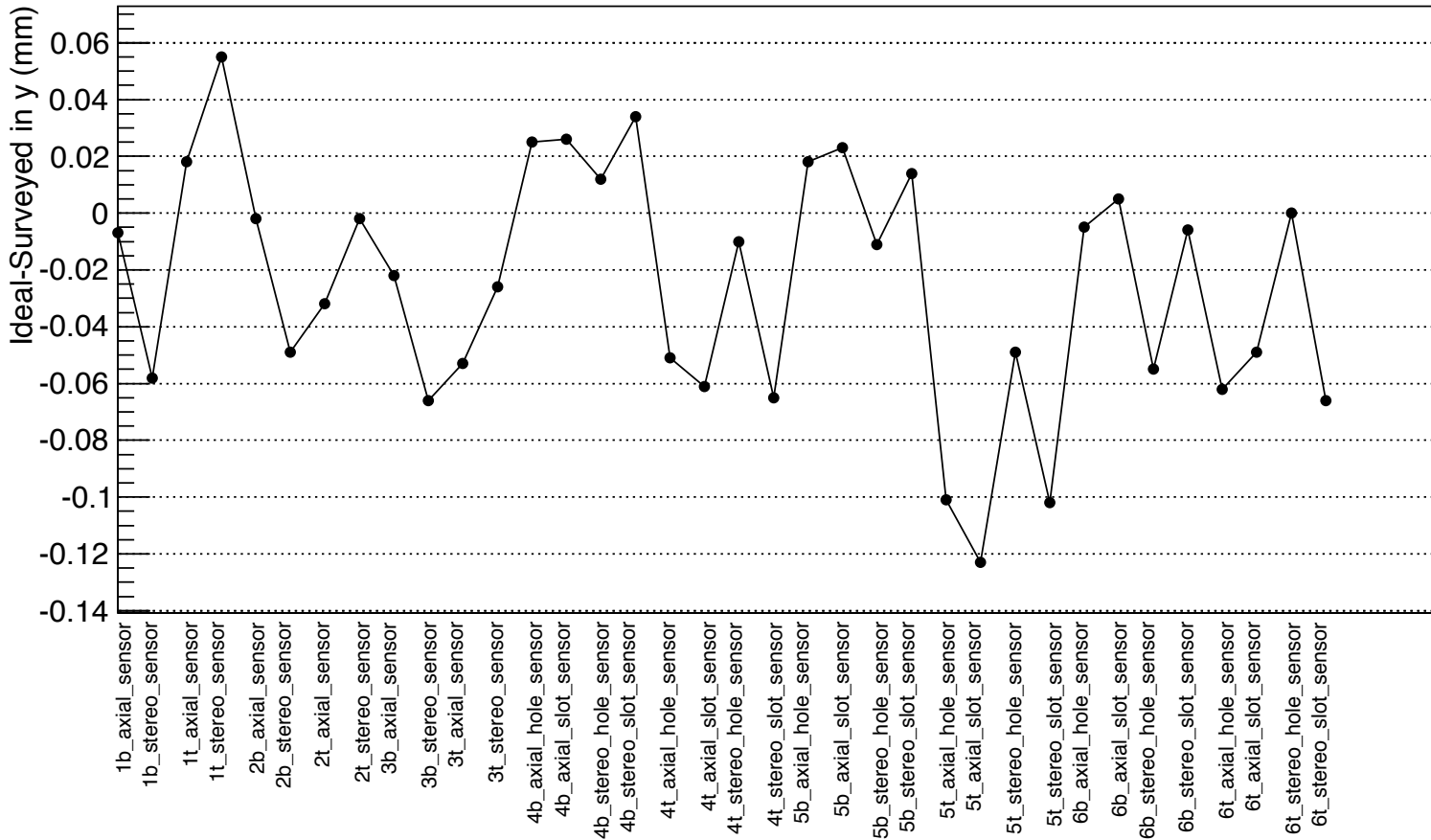
Survey – Sensor in global

sensorDiffGlobal-tmpSurv-FullSurvey-vs-tmpDef survey



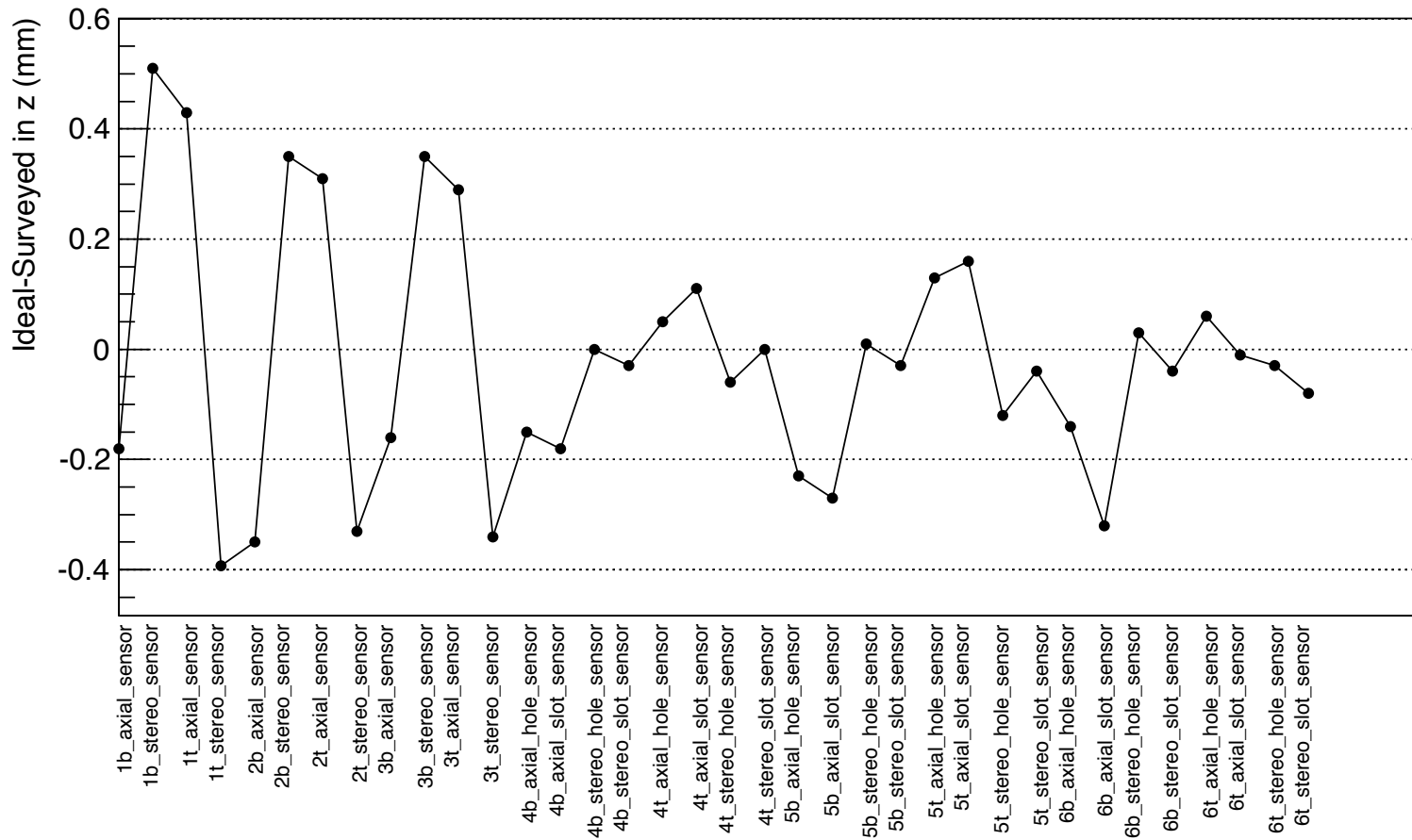
Survey – Sensor in global

sensorDiffGlobal-tmpSurv-FullSurvey-vs-tmpDef survey



Survey – Sensor in global

sensorDiffGlobal-tmpSurv-FullSurvey-vs-tmpDef survey



Rotations