

High Definition Survey Analysis (HDSA™)

Current conventional industry Multi-Station Analysis (MSA) focuses on the reduction of systematic error due to bottom hole assembly magnetic interference. This is reflected in the ISCWSA error model terms (table 1). The ISCWSA error model is a suggested generic performance framework and only addressed traditional survey correction methodology (MSA). It does not consider accelerometer scale and bias error.

Code	Term Description	Error Type	no correction Magnitude	MSA Magnitude	Units	Error Propagation
ABXY-T115	MWD TF Ind: X and Y Accelerometer Bias	Sensor	0.004	0.004	m/s2	Systematic
ABXY-T125	MWD TF Ind: X and Y Accelerometer Bias	Sensor	0.004	0.004	m/s2	Systematic
ABZ	MWD: Z-Accelerometer Bias	Sensor	0.004	0.004	m/s2	Systematic
ASXY-T115	MWD TF Ind: X and Y Accelerometer Scale Factor	Sensor	0.0005	0.0005	-	Systematic
ASXY-T125	MWD TF Ind: X and Y Accelerometer Scale Factor	Sensor	0.0005	0.0005	-	Systematic
ASXY-T135	MWD TF Ind: X and Y Accelerometer Scale Factor	Sensor	0.0005	0.0005	-	Systematic
ASZ	MWD: Z-Accelerometer Scale Factor	Sensor	0.0005	0.0005	-	Systematic
MBXY-T115	MWD TF Ind: X and Y Magnetometer Bias	Sensor	70	35	nT	Systematic
MBXY-T125	MWD TF Ind: X and Y Magnetometer Bias	Sensor	70	35	nT	Systematic
MBZ	MWD: Z-Magnetometer Bias	Sensor	70	35	nT	Systematic
MSXY-T115	MWD TF Ind: X and Y Magnetometer Scale Factor	Sensor	0.0016	0.0008	-	Systematic
MSXY-T125	MWD TF Ind: X and Y Magnetometer Scale Factor	Sensor	0.0016	0.0008	-	Systematic
MSXY-T135	MWD TF Ind: X and Y Magnetometer Scale Factor	Sensor	0.0016	0.0008	-	Systematic
MSZ	MWD: Z-Magnetometer Scale Factor	Sensor	0.0016	0.0008	-	Systematic

Table 1: OWSG Revision 2 MWD vs MWD+MS tool code all magnitude in 1σ

roundLAB's High Definition Survey Analysis (HDSA™) method is the next generation in survey corrections. HDSA™ utilizes a proprietary algorithm to correct accelerometer bias and scale factor terms to further reduce survey error. The HDSA algorithm combines magnetic systematic interference analysis with accelerometer analysis to greatly improve confidence of survey data (figure 1). The application of HDSA allows for improved wellbore placement, better separation factors for anti-collision and tightening of geologic targets.

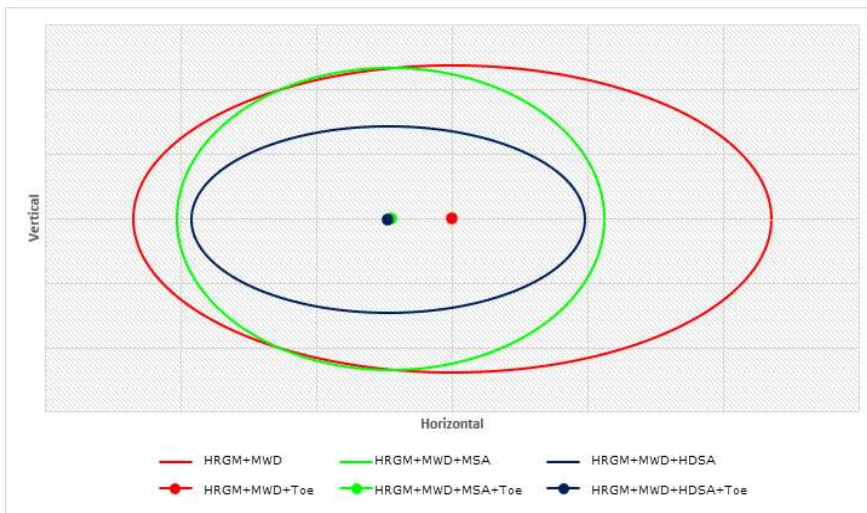


Figure 1: Ellipse reduction using roundLAB HDSA**

*Data parameters: 100 sample wells using Japan Aviation Electronics survey sensor packages at 2σ confidence.

**Figure 1 EOU depicts well drilling North-west with total depth of ~19,000ft and ~7200ft TVD at 2σ confidence

HDSA™ Benefits

- ✓ Reduces accelerometer error
- ✓ Improves TVD measurement
- ✓ Tighter geologic targets
- ✓ More accurate well placement
- ✓ Significant EOU reduction

Contact roundLAB to learn how to implement our HDSA service into your operations.