HYDRO2015

23-25 NOV. 2015 CAPE TOWN

DEVELOPING SUSTAINABLE HYDROGRAPHY IN AFRICA

Case study – the error budget of the positioning equipment for a sea mining vessel

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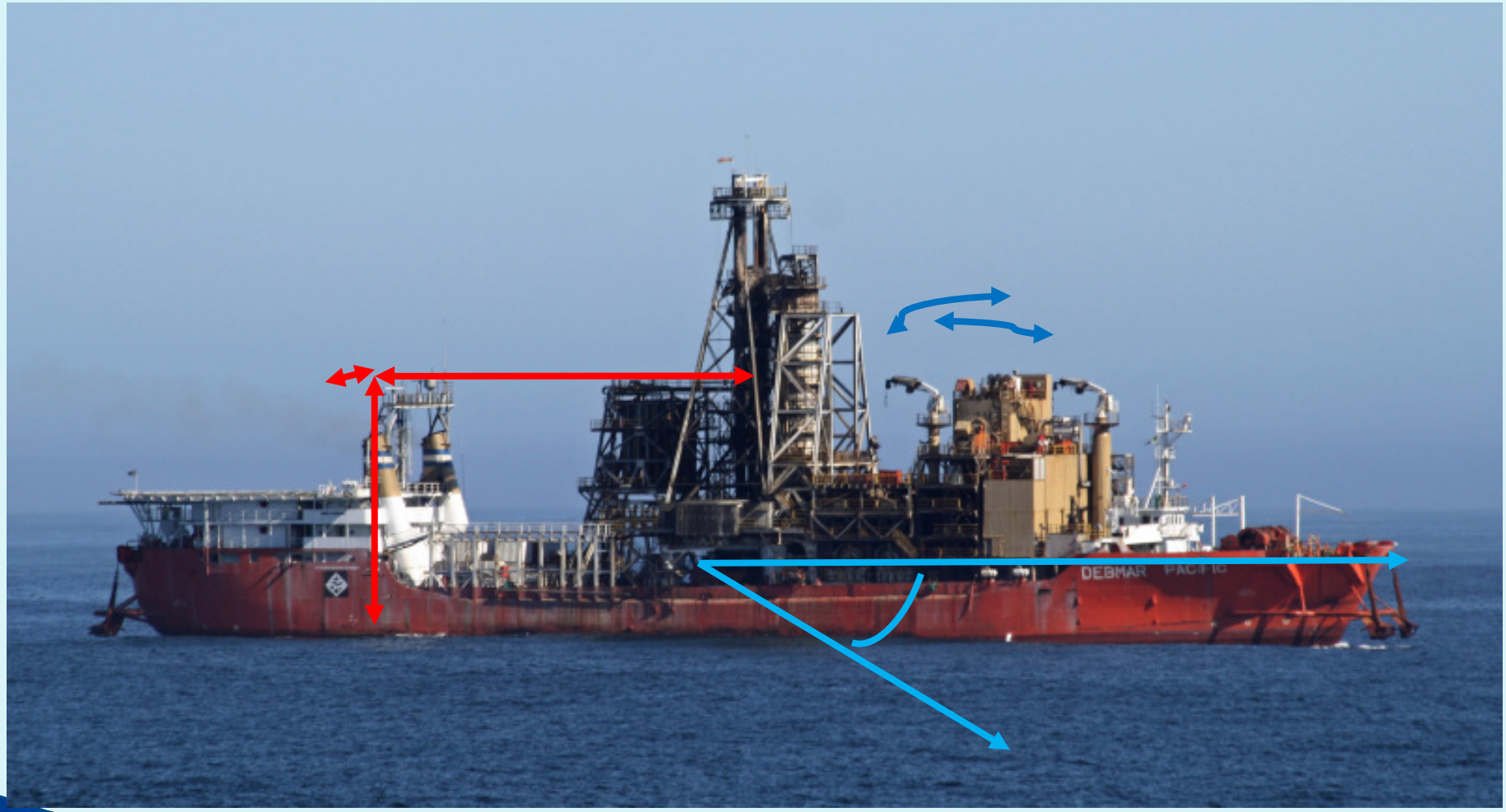
Debmarine Namibia

Namibia

DEBMARINE NAMIBIA
unlocking the sparkle

How precisely must all this be known?

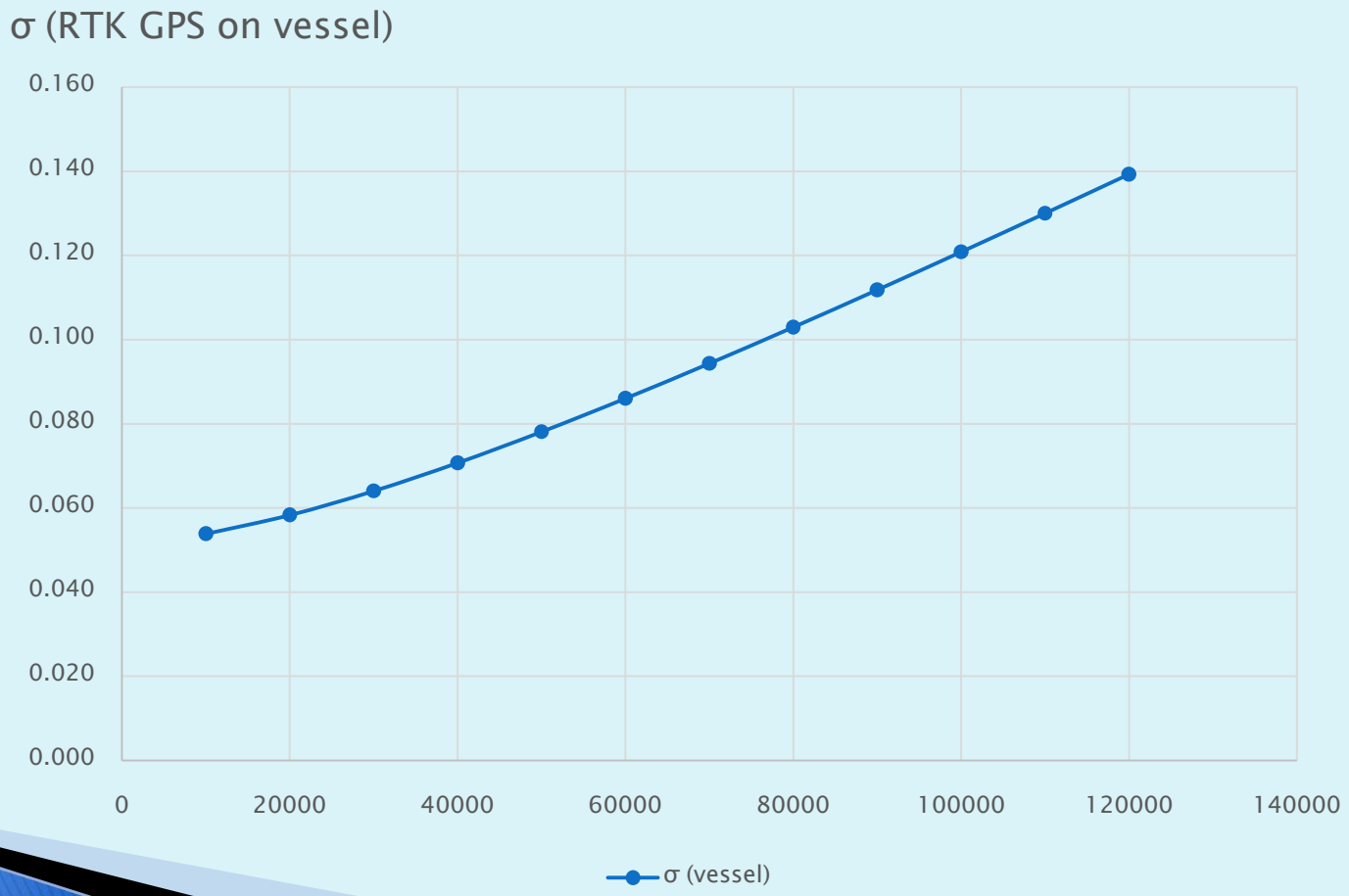


How precisely must all this be known?

- Breakdown into its separate components
  - GPS precision
  - Roll, pitch and gyro angles
  - Offset value precision

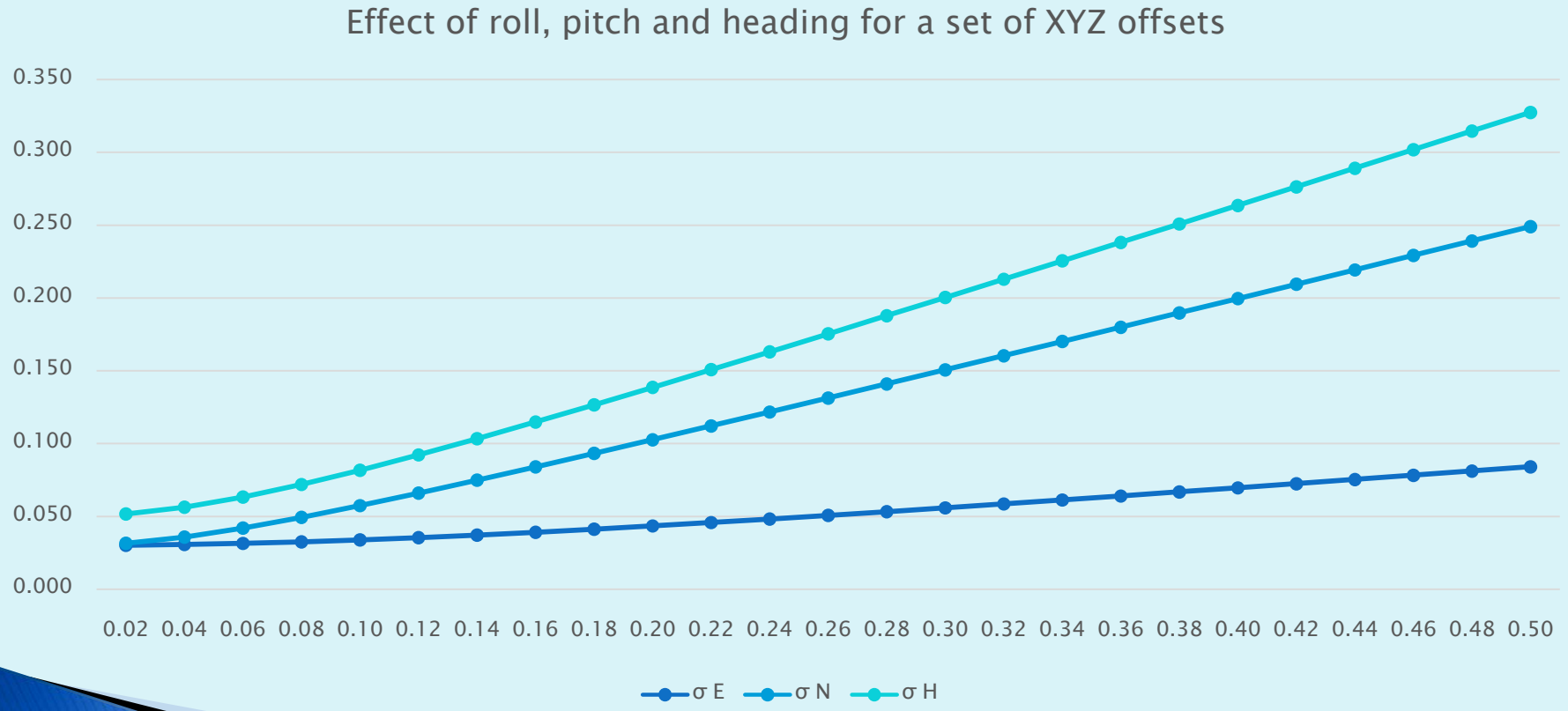
GPS precision

- RTK GPS vs satellite broadcast correction service



Effect of roll, pitch and gyro error

- Effect of MRU precision
- Effect of heading precision

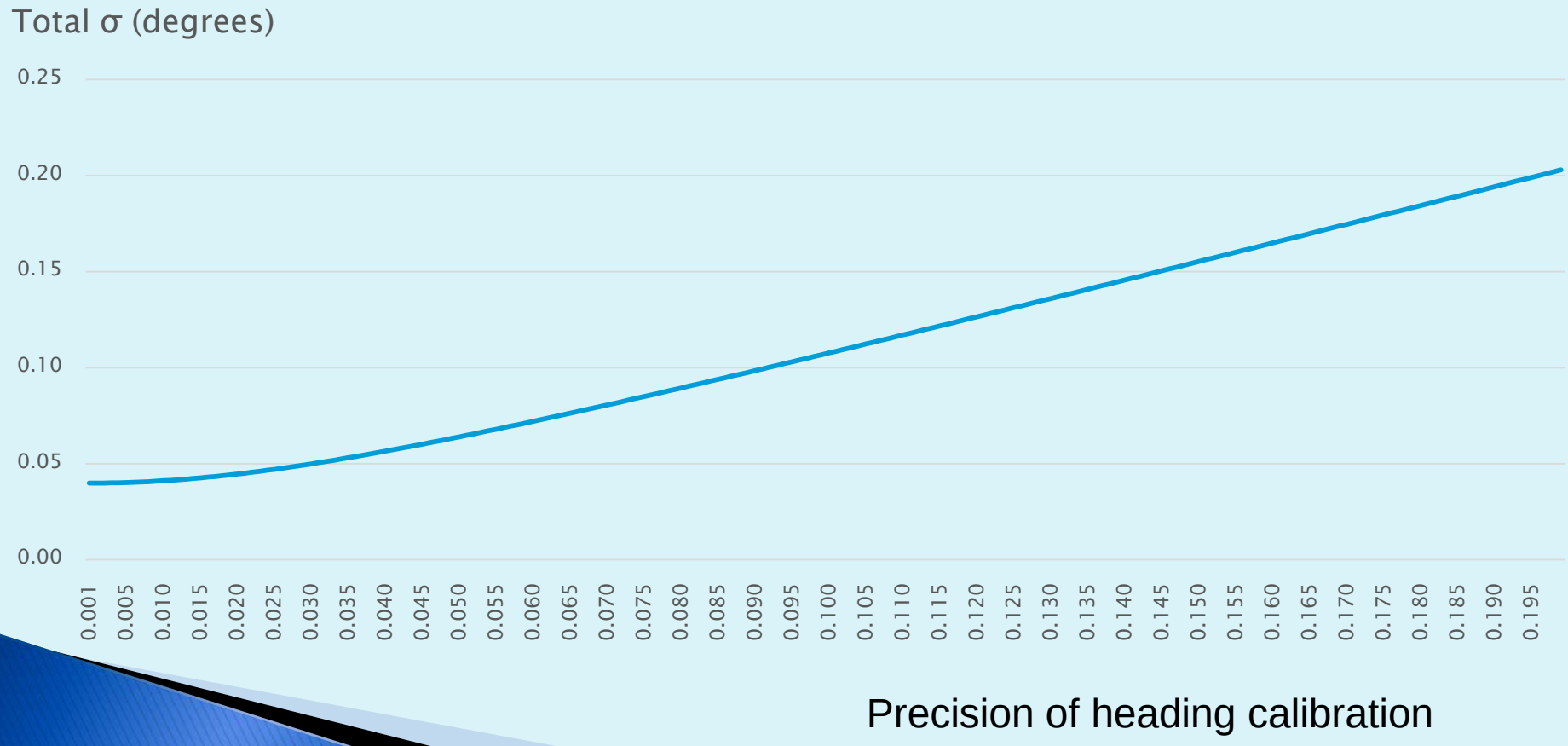


Attainable heading calibration

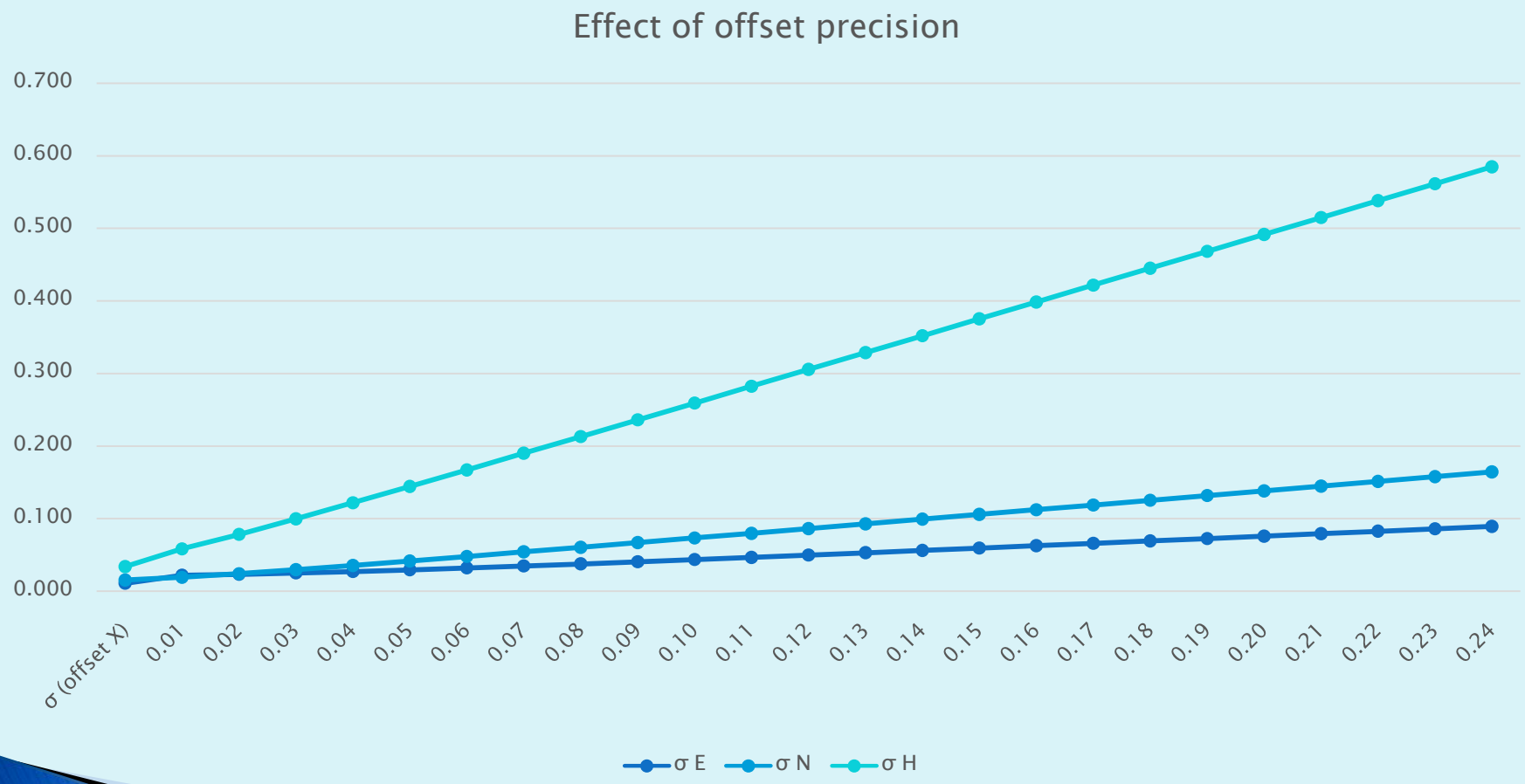
	ABC	
$\sigma^2(AB) = \sigma^2(CE) + \sigma^2(B) + \sigma^2(C)$	0.00019900	
$\sigma(AB)$	0.01411	°

How precise?

- How precisely must the heading value be determined so that the gyro's precision is not degraded?

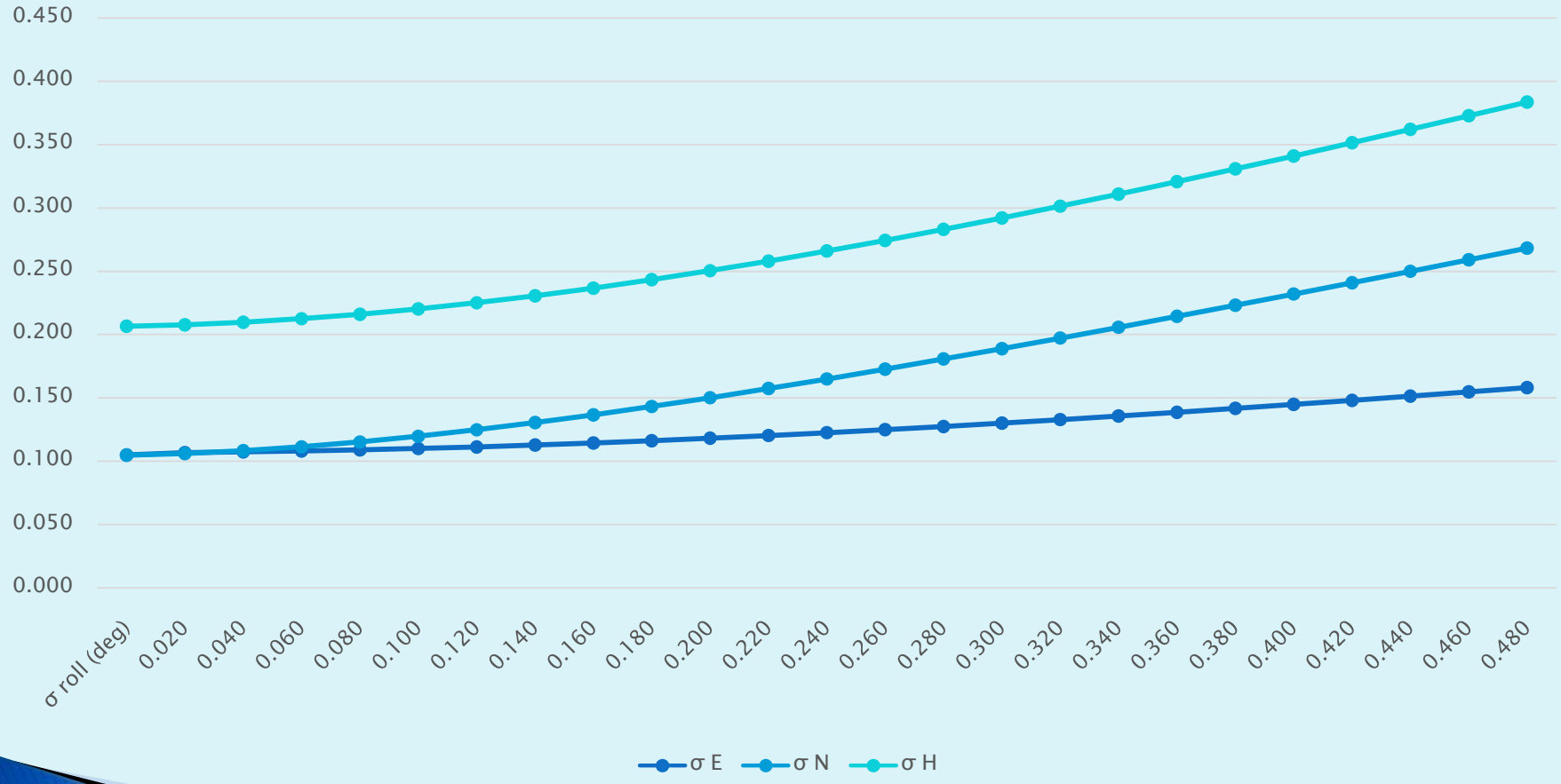


Effect of offset error

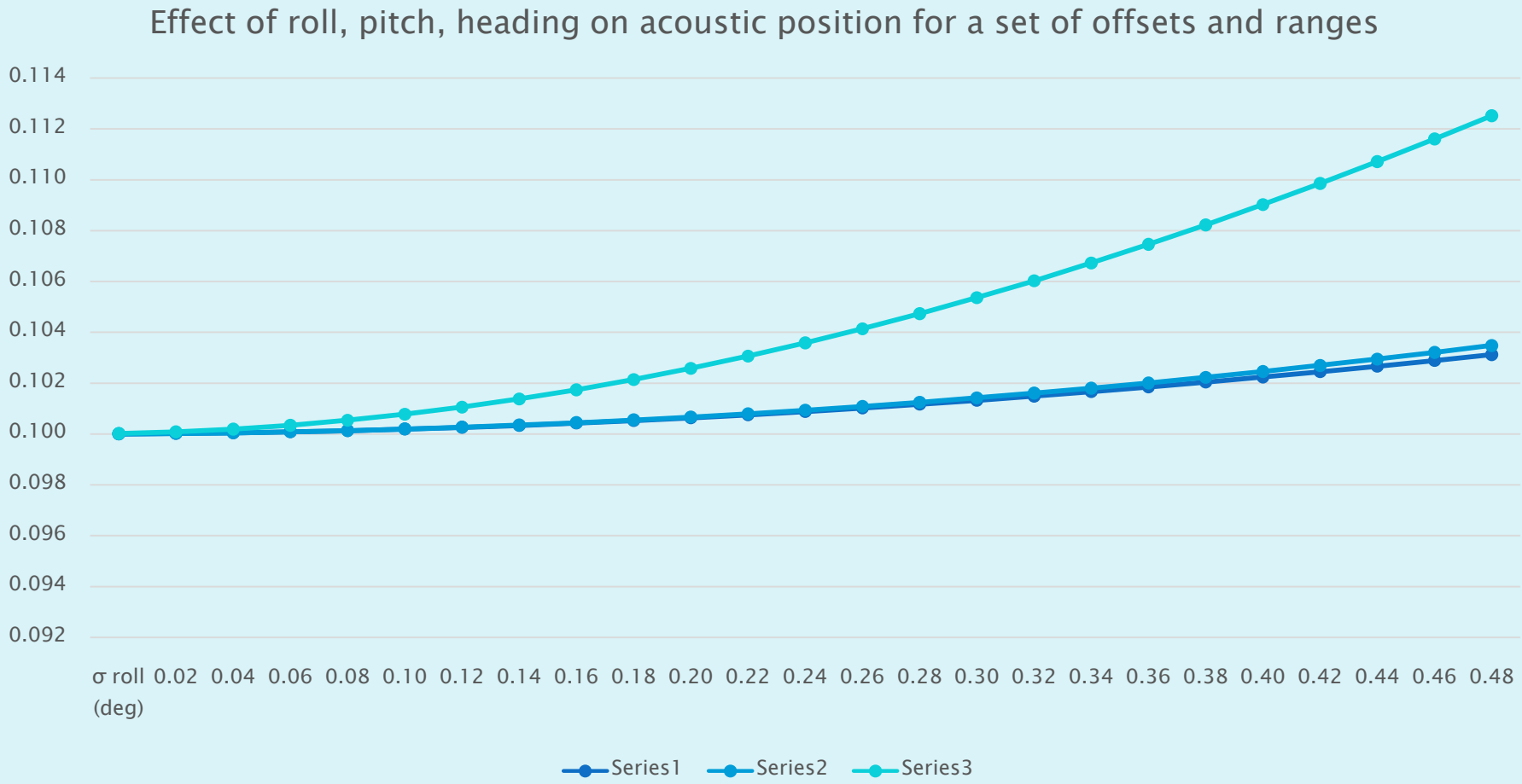


Combined effect

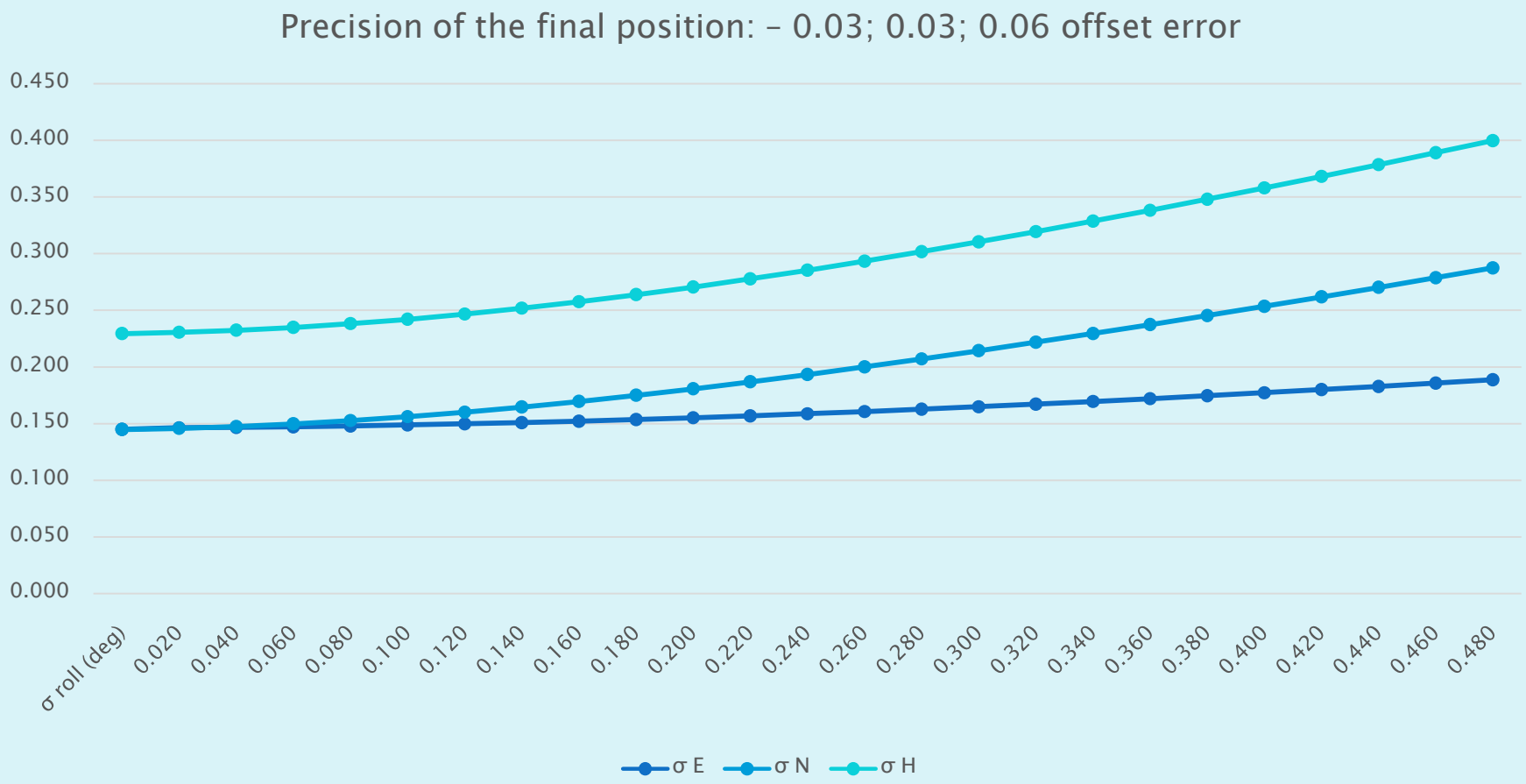
❖ Precision of the reference centre's position



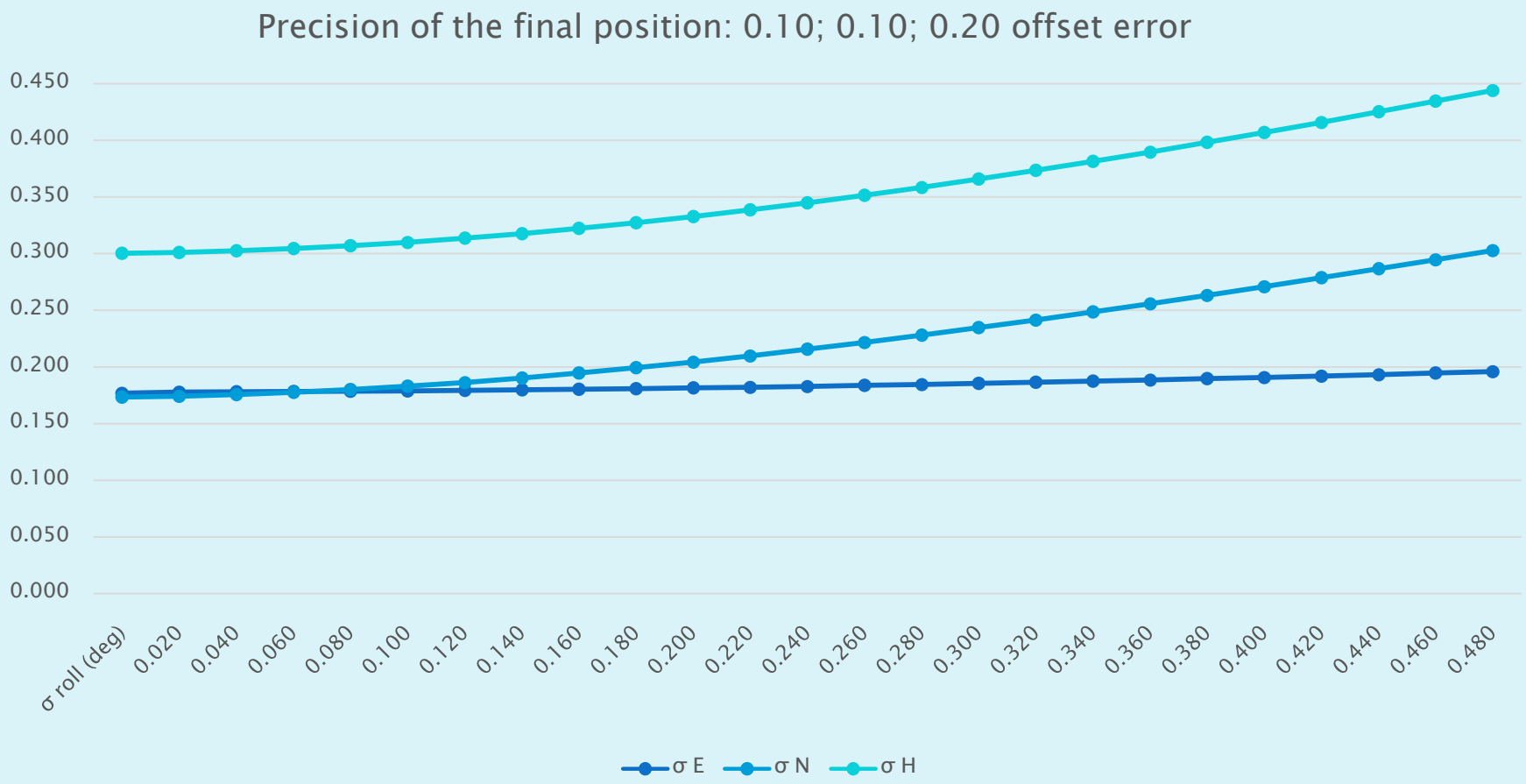
Acoustic precision



Overall combined effect



Effect of degraded offset precision



Conclusion

- Position of geological sampling
- Sampling tool is much larger than the errors
- Requires geostatistical calculations to determine limit.

Thank you