

Machine Tool Diagnosis by Circular Test

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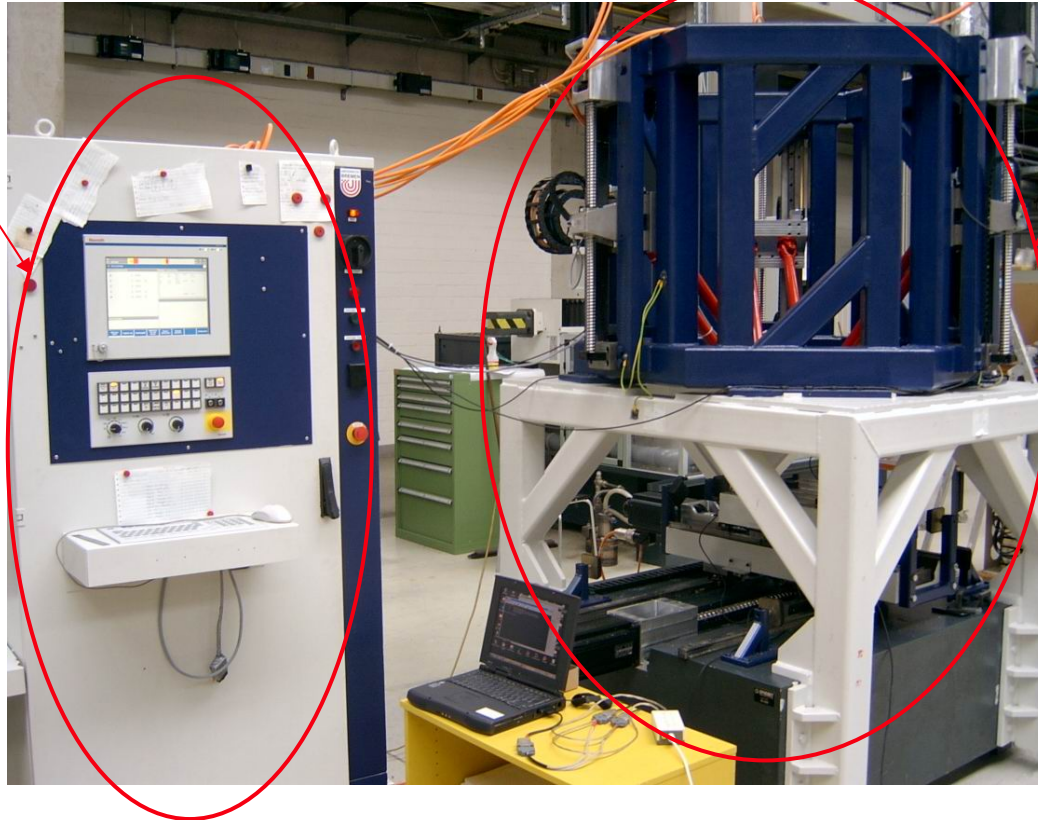
Bremen, 07. July 2009



- **Hybrid machine with parallel kinematic**
- **Circular Test**
- **Different methods for circular test**
- **QuickCheck Ballbar System**

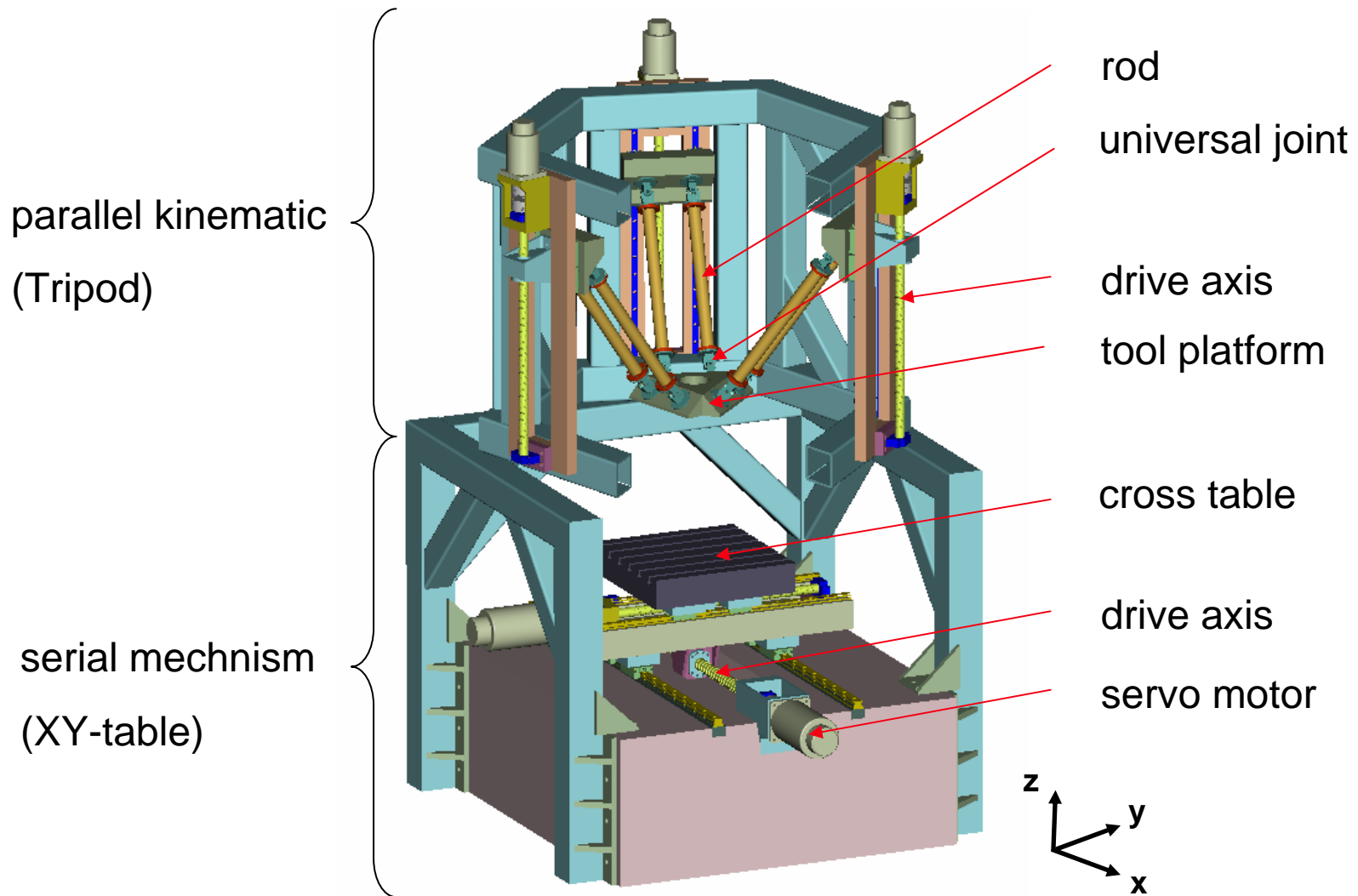
Hybrid Machine Tool (HMT)

Motion Control System



HMT

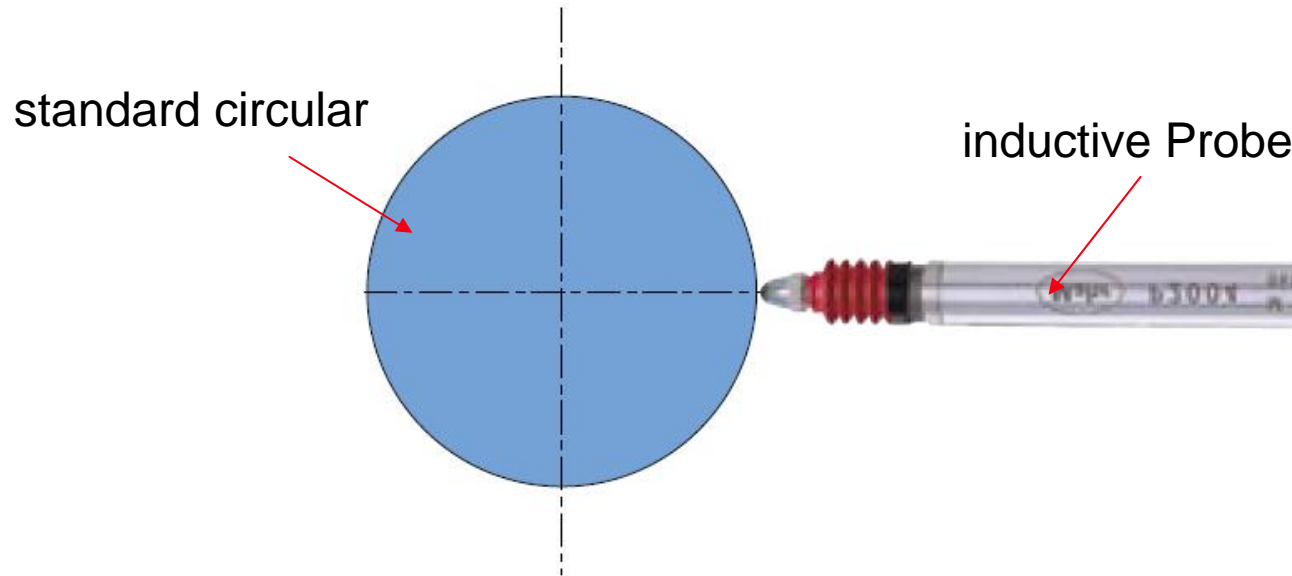
CAD-Model of HMT



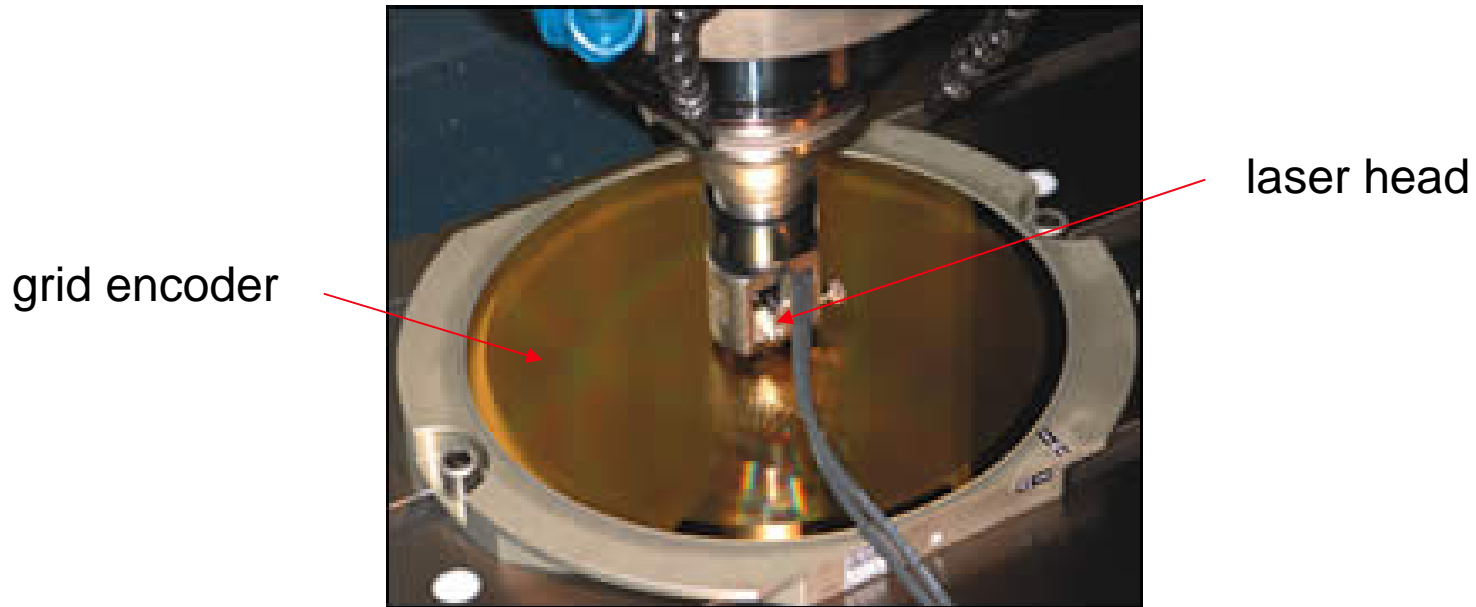
- **Circular test is used to measure geometric errors and position accuracy in a machine tool under true dynamic conditions.**
- **Circular test are suggested in both the ISO 230 and ISO 10791 standards.**
- **Different methods for circular test**
 - Circular Milling
 - Standard Circle
 - Grid Encoder
 - QuickCheck Ballbar System



- depending on the milling conditions
- Measuring machine is very expensive



- **Need many standard circle for different machine tools**



- **Grid encoder and laser system are relative expensive**



- **Machine errors can be diagnosed**
 - backlash, reversal spikes, servo mismatch, squareness, stick slip, straightness, machine vibration, etc.

Thank you for your Attention

