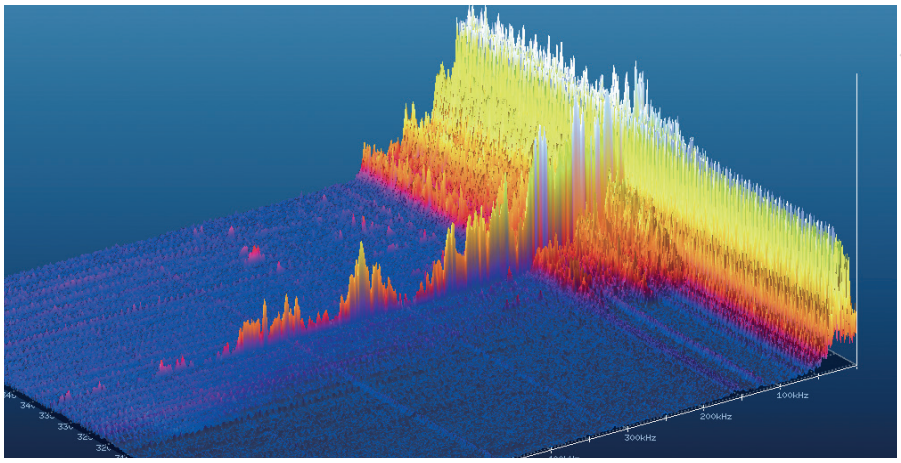
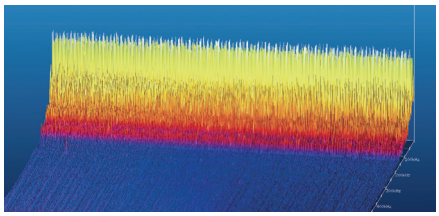
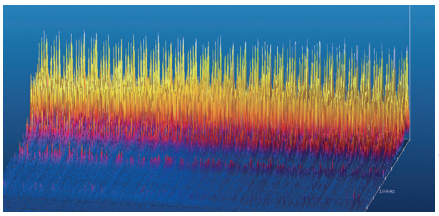
Tool Monitoring For Machining







The image shows how High-Frequency-Impulse-Measurement (HFIM) of QASS depicts a machining process. Especially obvious is the single, broadband signal in the middle of the 3D-graphic. Signals with that forming are characteristic for cracks. In this case the depiction shows exactly that - the break of an cutting edge of the machining tool.

Detection of breaks and worn edges

A machining process delivers as long excellent results, as the sharpness of the cutting tool is within the quality ensuring tolerance thresholds. If the **edge is too worn**, the surface of the work piece will become useless in the worst case.

Optimizer4D of QASS analyses **pulsed acoustic signals**, which occur during machining. The sharper the cutting tool, the more regular the emissions. With decreasing sharpness the high frequencied impulses are getting irregular, due to a tool that is decreasingly cutting and increasingly cracking the material.

Once the limits of tolerance are entered into, Optimizer4D is, automatically, **in real-time** and in-process, able to trigger a signal for changing if an edge reaches the limit of wear. That means maintenance in time instead of constant, fixed cycles.

Simultaneously, Optimizer4D detects the **break of an edge** right in the moment when the defect occurs. Thereby the necessity of a downstreamed testing procedure falls away and there is no production of break-related waste.

Monitoring of the edge sharpness:
Optimizer4D measures pulsed acoustic signals during the process, which occur by machining.
The duller a cutting tool, the more irregular and rougher are the signals in the HFIM-depiction (High-Frequency-Impulse-Measurement). The left depiction shows signals of an intact machining tool, the tool on the right depiction is worn out.

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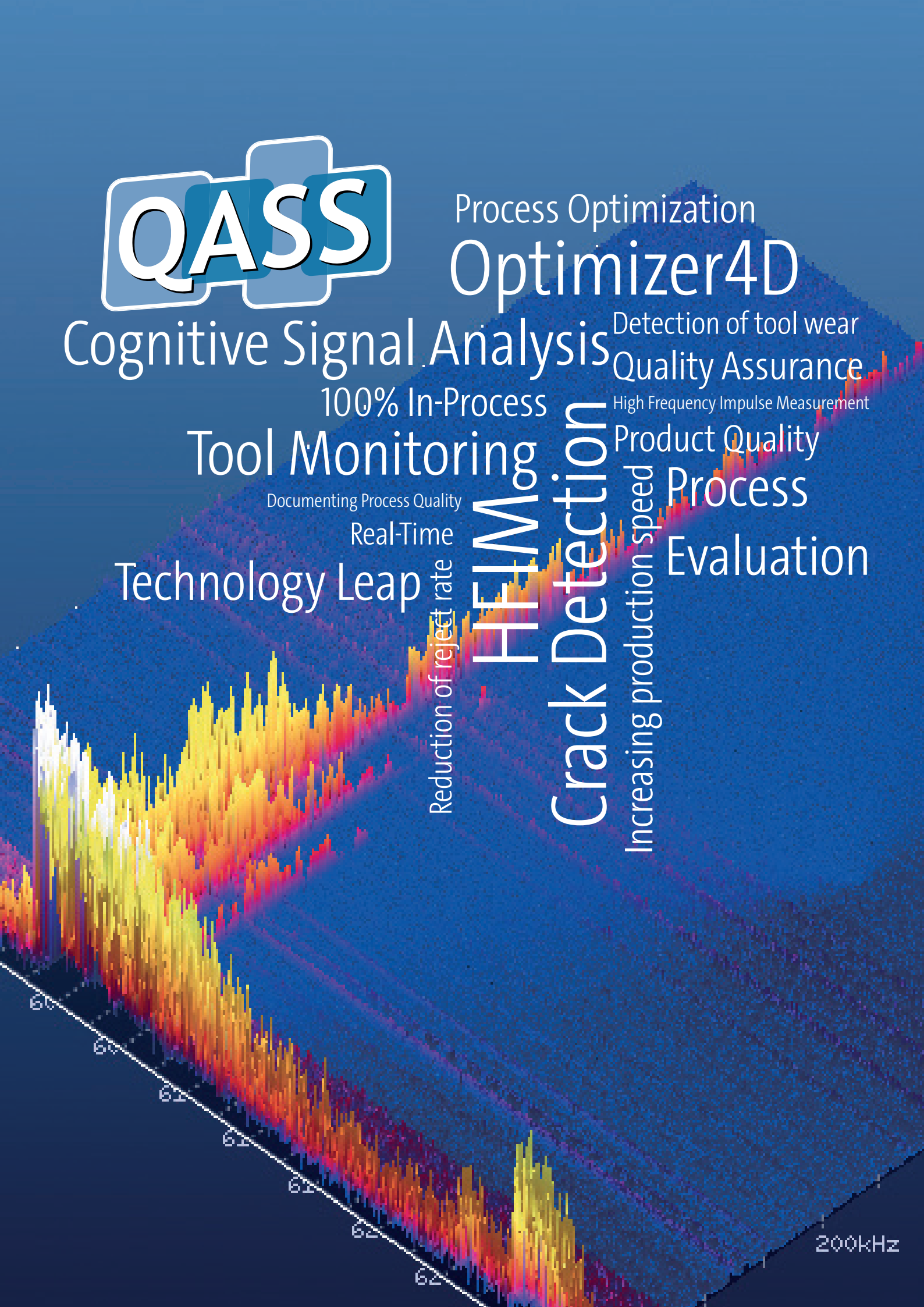
QASS
Process Optimization
Optimizer4D
Cognitive Signal Analysis
Detection of tool wear
Quality Assurance
100% In-Process
High Frequency Impulse Measurement
Tool Monitoring
Product Quality
Process
Documenting Process Quality
Real-Time
Evaluation
Technology Leap
HFI Mo
Crack Detection
Reduction of reject rate
Increasing production speed
200kHz