

## Pass-by Noise Measurement

One of the tests cars have to face is the Pass-by noise measurement test as per ISO 362 and SAE J1470. This also applies to agricultural and logging machinery.

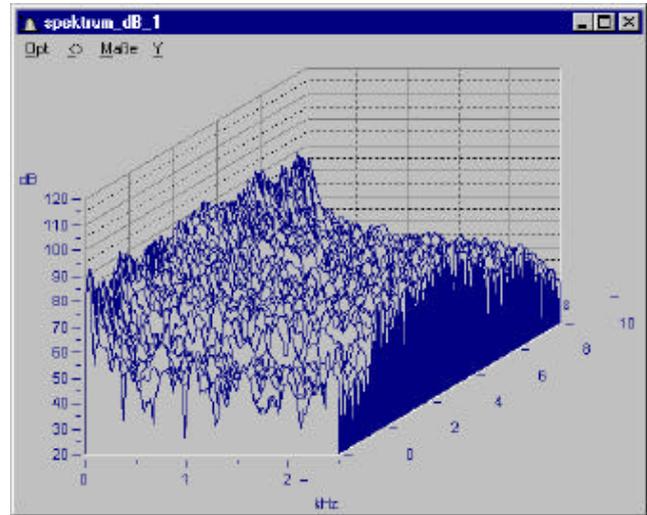
But already during product development, sound analysis to optimize machines is necessary. There, engines and gearboxes are the particular focus of the engineers.

The German gearbox manufacturer Sauer-Sundstrand has chosen a  $\mu$ -MUSYCS measurement system to perform acoustic evaluations of gearboxes built into harvesters. The system requirements included a stand-alone measurement system able to perform a measurement at a sampling rate of 40kHz. 80 online amplitude spectra of the measured signal per second was the most challenging demand.



With the help of Online FAMOS, a built-in DSP board,  $\mu$ -MUSYCS is able to perform up to 100 different online calculations and evaluations. Online digital filter calculations or online frequency analysis are only two examples. This immense power is necessary to calculate complex or very fast results.

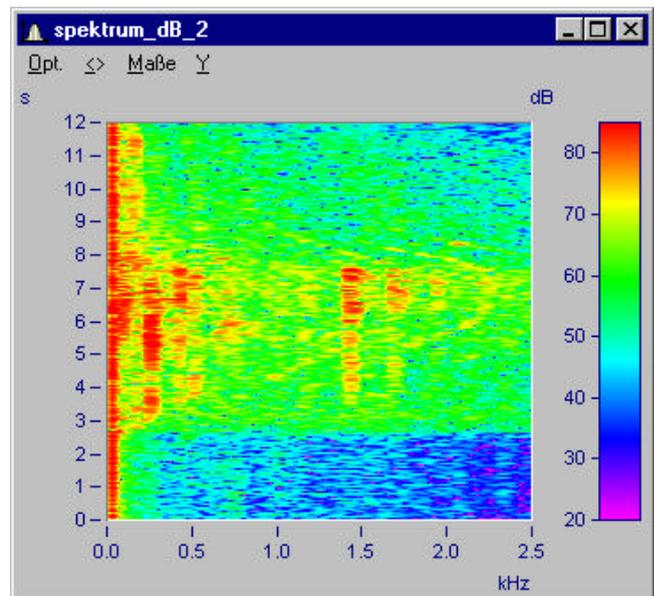
The data display too, plays a very important role. As can be clearly seen, a waterfall diagram like the one above in the right upper curve-window isn't able to



*Within 12 seconds nearly 1000 FFTs can be performed*

show significant frequencies quite as well as the color map below. Both figures represent exactly the same curves. But the 1.5 kHz noise of the gearbox can only be detected in the second diagram.

Last but not least, the system provides Sauer-Sundstrand's engineers with an automatic report generator, which creates print-outs and reports with ease.



*The Color-map diagram shows high frequency line around 1.5 kHz much better than the waterfall diagram above*

