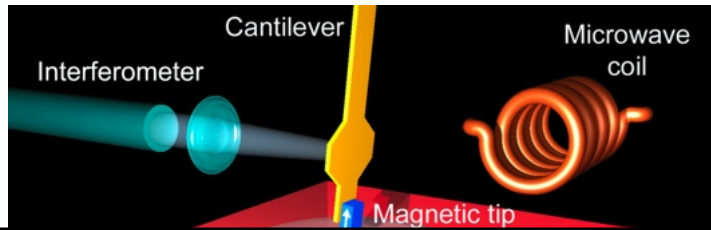


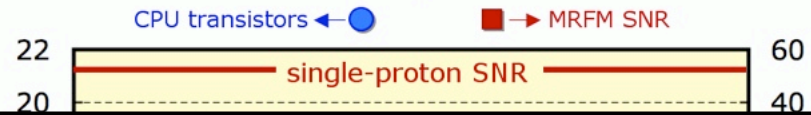
The Quantum System Engineering Roadmap: FAQ

Q3: What is a reliable technical path to practical quantum spin microscopy?

A3: The path is smaller, colder, quieter device generations

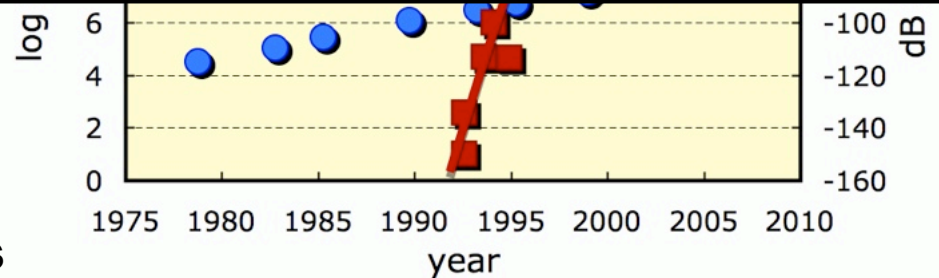


Moore's Law Progress in MRFM



Every MRFM device generation has performed as designed

- MRFM sensitivity has improved by 140 dB in twelve years
- Equivalent to doubling sensitivity every 3.1 months for 46 doublings
- MRFM has Moore's Scaling: smaller, colder, quieter devices work better



Moore's Law design rules

$$S_{\mu} = \frac{m}{g^2\tau} 2k_{\text{B}}T$$

$\left\{ \begin{array}{l} m \text{ cantilever mass} \\ T \text{ temperature} \\ g \text{ magnetic gradient} \\ \tau \text{ damping time} \end{array} \right.$

- smaller
- colder
- quieter