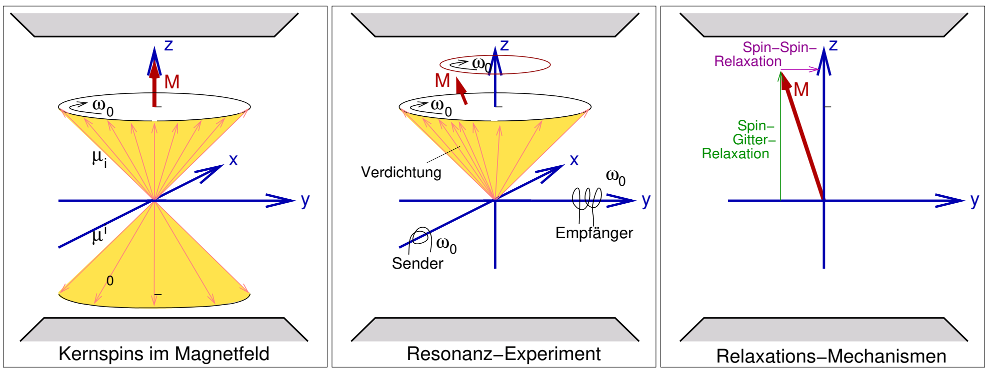
3. NMR-Spektroskopie

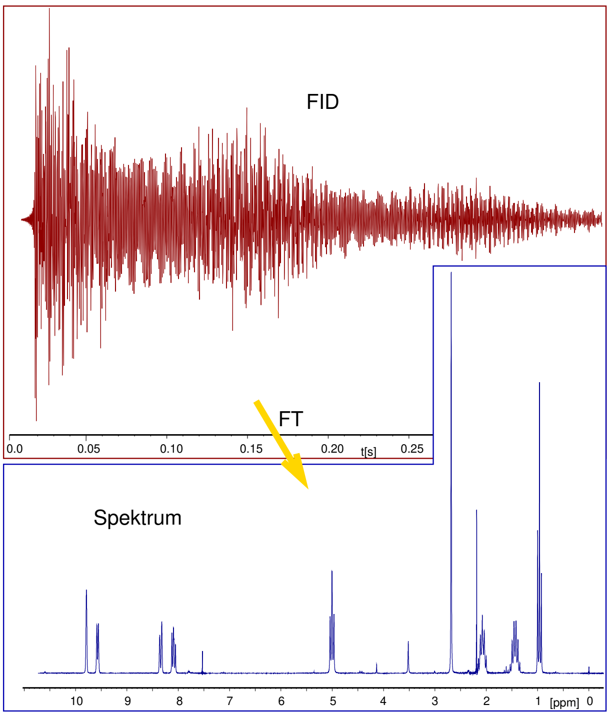
3.1. Prinzipien der Methode, Kerne, Meßverfahren

Isotop	I	Häufig-keit/%	g $/10^7$ rad $T^{-1}s^{-1}$	relative Frequenz/MHz	rel. Empfind-lichkeit
^{1}H	$\frac{1}{2}$	99.985	26.7519	100	1.0
^{2}H	1	0.015	4.1066	14.7	$1.5 \cdot 10^{-6}$
^{10}B	3	19.6	2.8746	10.7	$3.9 \cdot 10^{-3}$
^{11}B	$\frac{3}{2}$	80.4	8.5843	32.1	$1.3 \cdot 10^{-1}$
^{13}C	$\frac{1}{2}$	1.11	6.7283	76.2	$5.8 \cdot 10^{-7}$
^{14}N	1	99.6	1.9338	7.2	$1.0 \cdot 10^{-3}$
^{15}N	$\frac{1}{2}$	0.37	-2.712	10.1	$3.9 \cdot 10^{-6}$
^{19}F	$\frac{1}{2}$	100.0	25.181	94.1	$8.3 \cdot 10^{-1}$
^{27}Al	$\frac{5}{2}$	100.0	6.9760	26.1	$2.1 \cdot 10^{-1}$
^{31}P	$\frac{1}{2}$	100.0	10.841	40.5	$6.6 \cdot 10^{-2}$
^{73}Ge	$\frac{9}{2}$	7.8	-0.9357	3.5	$1.1 \cdot 10^{-4}$
^{197}Au	$\frac{3}{2}$	100	4.2342	16.2	$51.4 \cdot 10^{-1}$

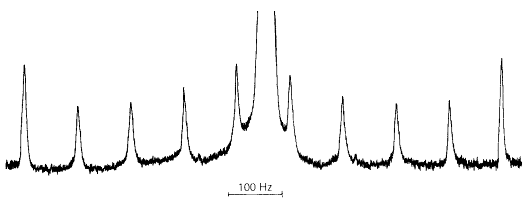
wichtige NMR-Kerne



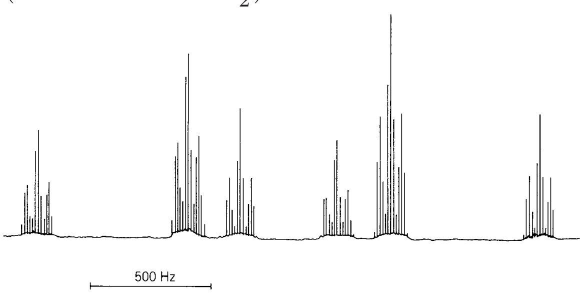
Prinzipien der Kernresonanzspektroskopie



FID und NMR-Spektrum (nach FT)



^{1}H-NMR-Spektrum von GeH_4 (8% ^{73}Ge mit I = $\frac{9}{2}$)



^{31}P-NMR-Spektrum von $PF_2H(^{15}NH_2)_2$