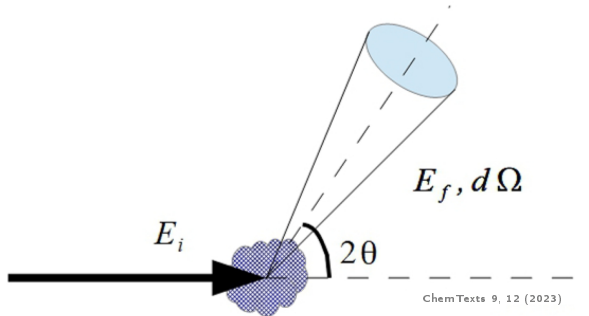
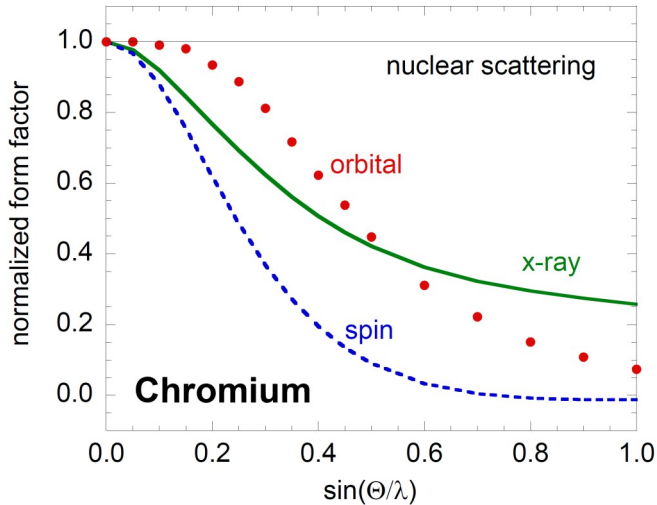


Scattering and structure factors





Neutron scattering lengths and cross sections

Isotope	conc	Coh b	Inc b	Coh xs	Inc xs	Scatt xs	Abs xs
H	---	-3.7390	---	1.7568	80.26	82.02	0.3326
1H	99.985	-3.7406	25.274	1.7583	80.27	82.03	0.3326
2H	0.015	6.671	4.04	5.592	2.05	7.64	0.000519
3H	(12.32 a)	4.792	-1.04	2.89	0.14	3.03	0

Source: Neutron scattering lengths and cross sections, NIST

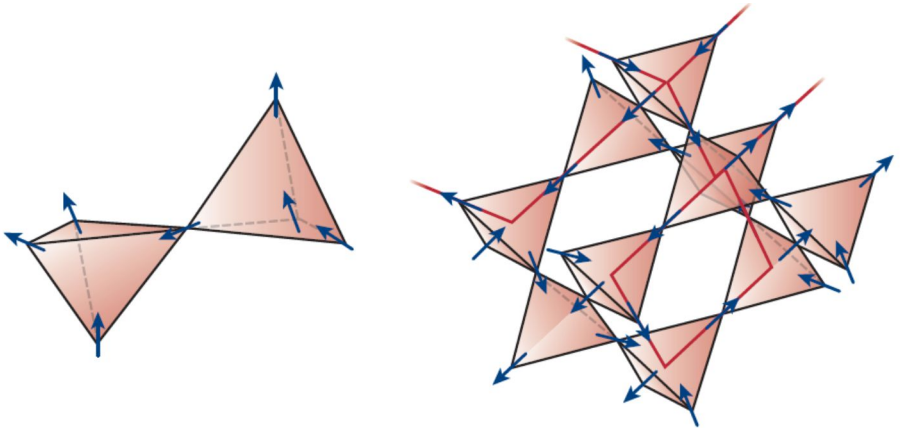
Neutron scattering lengths and cross sections							
Isotope	conc	Coh b	Inc b	Coh xs	Inc xs	Scatt xs	Abs xs
V	---	-0.3824	---	0.0184	5.08	5.1	5.08
50V	0.25	7.6	---	7.3(1.1)	0.5	7.8(1.0)	60.(40.)
51V	99.75	-0.402	6.35	0.0203	5.07	5.09	4.9

Source: Neutron scattering lengths and cross sections, NIST

Neutron scattering lengths and cross sections							
Isotope	conc	Coh b	Inc b	Coh xs	Inc xs	Scatt xs	Abs xs
Cd	---	4.87-0.70i	---	3.04	3.46	6.5	2520.(50.)
106Cd	1.25	5.(2.)	0	3.1	0	3.1(2.5)	1
108Cd	0.89	5.4	0	3.7	0	3.7	1.1
110Cd	12.51	5.9	0	4.4	0	4.4	11
111Cd	12.81	6.5	---	5.3	0.3	5.6	24
112Cd	24.13	6.4	0	5.1	0	5.1	2.2
113Cd	12.22	-8.0-5.73i	---	12.1	0.3	12.4	20600.(400.)
114Cd	28.72	7.5	0	7.1	0	7.1	0.34
116Cd	7.47	6.3	0	5	0	5	0.075

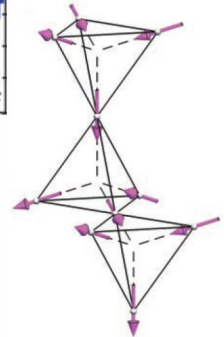
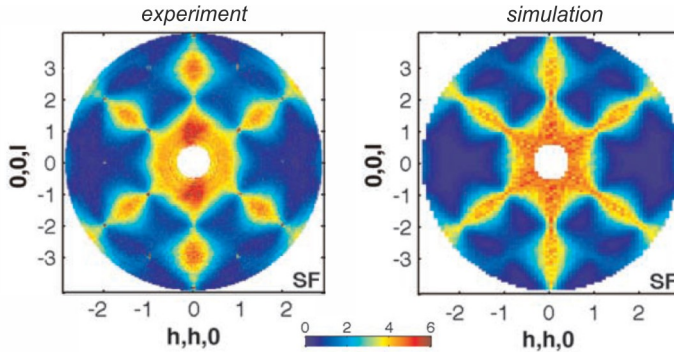
Source: Neutron scattering lengths and cross sections, NIST

Neutron scattering lengths and cross sections							
Isotope	conc	Coh b	Inc b	Coh xs	Inc xs	Scatt xs	Abs xs
Gd	---	6.5-13.82 <i>i</i>	---	29.3	151.(2.)	180.(2.)	49700.(125.)
152Gd	0.2	10.(3.)	0	13.(8.)	0	13.(8.)	735.(20.)
154Gd	2.1	10.(3.)	0	13.(8.)	0	13.(8.)	85.(12.)
155Gd	14.8	6.0-17.0 <i>i</i>	(+/-)5.(5.)-13.16 <i>i</i>	40.8	25.(6.)	66.(6.)	61100.(400.)
156Gd	20.6	6.3	0	5	0	5	1.5(1.2)
157Gd	15.7	-1.14-71.9 <i>i</i>	(+/-)5.(5.)-55.8 <i>i</i>	650.(4.)	394.(7.)	1044.(8.)	259000.(700.)
158Gd	24.8	9.(2.)	0	10.(5.)	0	10.(5.)	2.2
160Gd	21.8	9.15	0	10.52	0	10.52	0.77



Ice rule: two-in, two-out

No long-range order \rightarrow no magnetic Bragg peaks,
but *diffuse scattering* instead



Pinch points are a signature of spin-spin correlations defined by the ice rule