

Project description

Optically detected magnetic resonance in solid helium

The electrical influence of the electron spin of caesium should be measured in a fixed helium matrix with optically detected magnetic resonance.

For this purpose, I designed a compact pressure cell for a cryostat that met very strict electrical, magnetic, optical, and mechanical requirements. The beam from the excitation laser had to be guided specifically so that the stray light did not overlap the weak atomic emission.

I developed transparent electrodes that ensured the required homogeneous electrical field.

Objectives and key figures



- ✓ Non-magnetic pressure cell designed for 30 bar
- ✓ Window in cell tight at 1.6 K and 30 bar
- ✓ Temperature in the pressure cell stabilized at 10^{-6}
- ✓ Transparent high-voltage electrodes developed
- ✓ Reduced stray light with ray tracing software
- ✓ Detection system improved by APD
- ✓ Hardware designed and optimized for PID controllers
- ✓ Operation of the cryostat greatly simplified



April 1998 – February 2003



Budget 700'000 CHF



Three team members



Research and development

