

Lasers SOP in 471

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Section 1: Overview

The Lab uses several lasers in our various locations of varying power ratings. All Lasers should be considered dangerous and caution shall be taken when in use. No person should be operating any lab Laser system unless trained to do so and they have completed both the DRS training and TEM specific training.

The four lasers in the lab are:

1. NewFocus 637 nm (0.2 mW)
2. Vitawave 637 nm (2 mW)
3. LaserGlow 532 nm (40 mW)
4. LaserGlow 532 nm (500 mW)

All lasers are within the visible spectrum. The lasers are used to drive optical transitions in NV defects in diamonds.

Section 2: Risk Assessment Summary

Direct or indirect eye exposure to laser beam can cause eye damage. NEVER put yourself into any position where your eyes approach the axis of a laser beam (even with eye protection on). Do not direct laser emission towards other people. Do not damage laser protective housings, or defeat the interlocks on these housings. Never use viewing instruments to look directly into a laser beam or its specular reflection. Keep ambient light levels as high as operations will permit. Visitors should not be permitted to observe a laser experiment without first receiving a laser safety briefing and being issued laser eye protection.

Section 3: Controls

- Make sure laser warning light on the door outside is turned on.
- Put on appropriate laser safety glasses and ensure that they have been inspected in the past 6 months for scratches.
- Clear optical table of shiny obstructions that can cause reflections.

- Work with an attenuated laser beam while aligning.
- Use beam blocks wherever appropriate. In most experiments with diamond defects, beam block should be placed behind diamond.
- Ensure correct dichroic mirrors are being used when performing confocal experiments on diamonds. Reflected light from dichroics must be isolated.
- Make sure all laser beam paths are terminated at the appropriate places before turning up the laser power.
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Special Precautions

Follow any pertinent safety precautions listed in the laser manufacturer's published owner's manual.

Personal safety

Eyewear must be of the correct optical density and offer protection at the wavelength of the lasers being used. Eyewear will only protect your eyes for short time periods, depending on the laser power. Therefore, do not look directly into any laser beam, even with laser eye protection on. Periodically inspect and replace damaged or defective eyewear. Check the Laser safety goggle checkoff sheet to see if this has been done recently. Check goggles yourself and initial and date the sheet.

Section 4: Operating Procedure

- Make sure laser warning light on the door outside is turned on.
- Inspect safety glasses for scratches
- Put on safety glasses
- Make sure laser is turned to the minimum power setting if aligning
- Make sure that beam paths are at a safe height (not at eye level when seated or standing).
- Turn on laser power by turning interlock key
- Use beam blocks to block high-power beams at their source (except when the beam is actual needed for alignment).
- Make sure all beams and reflections are terminated before high-power operations begin.

Section 5: Emergency Response

Emergency Procedures

In case of accident turn off the system immediately and verbally indicate this for others. Secure the system and help anyone who may need assistance. Call 911 and stay in the area until help arrives. Do not dispose of protective gear in particular goggles as they may help determine the direction and level of beam during the incident.

First Aid

Seek medical attention if you suspect Laser contact with your eye or in the case of high power systems with your skin.

Section 6: Training

Training will be provided by university personnel as needed.