Advanced Lab course: Knowledge check list

F85/86/87: Basic Optics

Part 1:

What kind of polarization has a HeNe Laser ususally and why? How is the polarization of light defined? What kind of polarization exist? What are the Jones matrices? What are the Stokes vectors? What is the Poincare sphere? What is Brewster's Angle? What are the Fresnel Formulas? how does a polariser work? What is dichroism? what is the index ellipsoid? How does one determine the optical axes? What is a quarter wave plate? What is a half wave plate? How does a PBS work? What is the Faraday effect?

Part 2:

What is the Pockels effect? What is a Mach-Zehnder Interferometer? How must the k-vectors of the branches relate to each other? Why using a BS not a PBS? How does a Pockels cell work? How can one measure the light power incident on a photodiode with an oscilloscope? Application of EOMs?

Part 3:

How does an AOM work? What is an VCO? What is the Debye-Sears effect? What is the Bragg regime? What is coherent light? Is it possible to filter sun light, such that it is equal to laser light? Application of AOMs?

This does not substitute a careful reading of the manual ("Versuchsanleitung"). Students must be prepared to start on the first day with Part 2 or Part 3 instead of Part 1.

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