河北大学2008年博士研究生入学考试试题

（套别：A）

学科、专业	研究方向	考试科目	考试时间
光学工程	01，02，03，04, 05	专业英语	

I. Translate the following passage into Chinese.

When a Fabry-Perot interferometer is illuminated by quasi-monochromatic light which does not satisfy condition (23), the form of the intensity distribution of the transmitted light differs from that given by (27), and yields some information about the spectral distribution of the light used. In particular, suppose the light has two monochromatic components, if we imagine that their wavelength difference is gradual increased, and provided they do not differ too greatly in intensity, their presence will evidently be evident from the presence of two mutual displaced sets of maxima in the interference pattern. The components are then said to be resolved by the interferometer. In this way, Fabry and Parot were able to observe directly the fine structure of spectral lines which Michelson could only infer, and the Fabry-Perot interferometer has since played a dominant role in this branch of spectroscopy.

In order to compare the powers of different instruments to resolve spectral structure, it is convenient to consider the case when the two components are of equal intensity, and to fix somewhat arbitrary a displacement of maxima at which the components may be said to be "just resoved". If $\lambda_0\pm 1/2(\Delta\lambda_0)$ are the wavelengths of the two components, the quality $\lambda_0/\Delta\lambda_0$ is called the resolving power of the instrument. Such a criteria of resolution was first introduced by Lord Ryleigh, in connection with prism and spectroscopes, where the intensity distribution for monochromatic light is of form $I(\delta)=[\sin(\delta/2)/(\delta/2)]^2 I_{max}$. Rayleigh proposed that, in this case, two components of equal intensity should be considered to be just resolved when the principal intensity maximum of one coincides with the first intensity minimum of the other; in the combined distribution, the ratio of the intensity at the midpoint to that at the maxima is then 0.811.

II. Translate the following passage into English.

以上只讨论了一维光栅，但这一分析很容易推广到二维和三维晶体结构的衍射物体。二维光栅（有时称为交叉光栅）还没有什么实际应用。虽然它们的效应在实际生活中我们经常观察到，例如，通过一个细织物体（如手帕等）去看一个亮光源。相反，三位光栅（有时称为空间光栅）的理论则非常重要，因为原子在晶体中的规则排列就形成这种光栅。晶格距离（相邻原子间的距离）是1埃左右，这也是X射线波长的数量级。因此，使一束X射线通过晶体，可以产生衍射图样，而且从分析这种图样可以了解晶体的结构。我们将在§13.1节再对这个课题进行深入讨论。