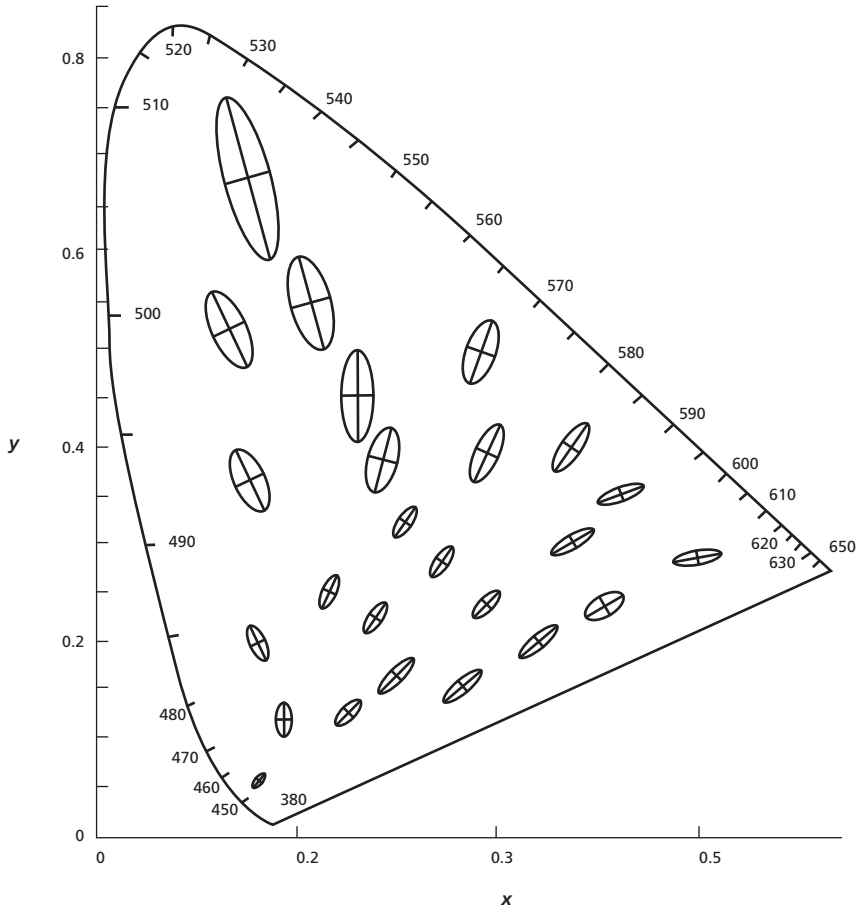

Figure 2.13 The CIE 1931 chromaticity diagram with the MacAdam ellipses displayed, multiplied ten times (after MacAdam, 1942, from the IESNA Lighting Handbook)

2.3.6 Light spectrum and movement

Adaptation luminance and position relative to the fovea are major factors in determining thresholds. Other factors, such as light spectrum and movement of the target are also important. Visual acuity is only slightly influenced by light spectrum, light sources with greater energy at short wavelengths enhance visual acuity. As for movement, as long as the movement is slow enough and smooth enough to allow the retinal image of the target to be kept on the fovea, visual acuity is only slightly worsened. However, smooth movements faster than 40 degrees per second or erratic movement at slower speeds will lead to a dramatic deterioration in visual acuity.

2.4 Suprathreshold performance

Threshold measurements are used to define whether or not a target will be seen. When the target can be seen every time, it is said to be suprathreshold and the question of interest becomes how quickly and accurately the work of which the target is a part can be done. The answer to this question depends on the structure of the task. Most apparently visual tasks actually have three components; visual, cognitive and motor. The effect of lighting on task performance depends on the place of the visual component relative to the cognitive and motor components. Tasks in which the visual component is large or limiting will be more sensitive to changes in lighting conditions than tasks where the visual component is small or unimportant.