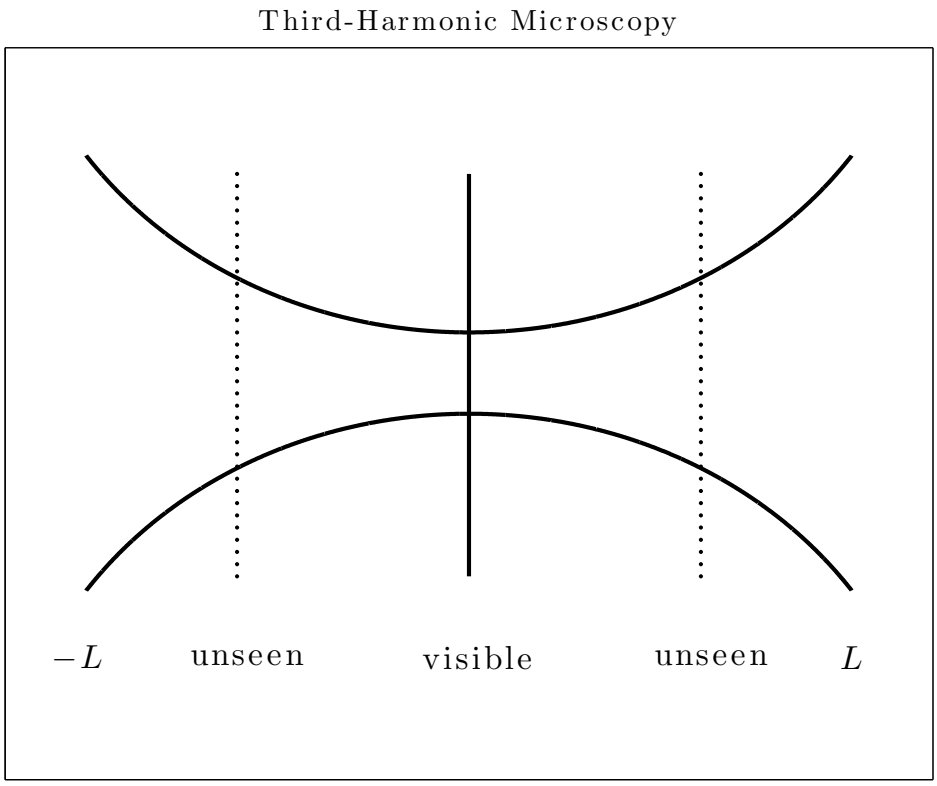

Figure 5.6 In the limit in which the distance L is much larger than the wavelength λ, the integral (5.128) is non-zero when an edge (solid line) lies where the beam is focused but not when a feature (dots) lies where the beam is not focused. Only features within the focused region are visible.

which is in the UHP since the length $b > 0$, but no singularity in the LHP $y < 0$. So the integral of $f(z)$ along the closed contour from $z = -R$ to $z = R$ and then along the ghost contour vanishes. But since the integral along the ghost contour vanishes, so does the integral from $-R$ to R. Thus when the dispersion is normal, the third-harmonic signal vanishes, $E_3 = 0$, as long as the medium with constant $\chi^{(3)}(z)$ effectively extends from $-\infty$ to ∞ so that its edges are in the unfocused region like the dotted lines of Fig. 5.6. But an edge with $\Delta k > 0$ in the focused region like the solid line of the figure does make a third-harmonic signal E_3. Third-harmonic microscopy lets us see features instead of background. □