Example 12.5 Graphical Interpretation

This example studies an interesting graphical interpretation of \( \omega_0 = \frac{1}{\sqrt{LC}} \) and the characteristic impedance \( \sqrt{L/C} \).

Figure 12.13 shows contours of constant \( \omega_0 = \frac{1}{\sqrt{LC}} \) and constant \( \sqrt{L/C} \) in the \( L-C \) plane over practical ranges for \( L \) and \( C \). These contours are straight lines in the figure owing to the logarithmic scales of the figure. This figure is particularly useful for finding \( \omega_0 \) and \( \sqrt{L/C} \) for a given \( L \) and \( C \), and vice versa, for example.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{contours}
\caption{Contours of constant \( \omega_0 = \frac{1}{\sqrt{LC}} \) and constant \( \sqrt{L/C} \) in the \( L-C \) plane.}
\end{figure}