Figure 2.2. The Indicator Function of a Union of Disjoint Intervals. Shown is indicator function $I_F(\omega)$ of $F = \bigcup_{i=1}^{4}(a_i, b_i)$. The combined length of the intervals $\sum_{i=1}^{n}(b_i - a_i)$ is given by the integral $\int I_F(\omega)\,d\omega$.