Lectures 13-14

§ Green's functions II

– Provides solution for non-homogeneous DE:

$$\mathcal{L}y(x) = -f(x)\,; \qquad \mathcal{L}G(x,x') = -\delta(x-x')$$

then:

$$y(x) = \int_a^b G(x,x')f(x')dx'$$

– Eigenfunction expansion:

$$G(x,x') = \sum_n \frac{\phi_n(x)\phi_n^*(x')}{\lambda_n}$$

where $\mathcal{L}\phi_n(x) = -\lambda_n w(x)\phi_n(x)$

– Method for constructing Green's fns. in 1-d

lectures 13-14 (contd.)

§ Fourier Transforms, $\mathcal{F}$

- Fourier integral theorem
- The discrete to continuous transition: Fourier series to integral
- The finite wave train example; uncertainty
- $\mathcal{F}$ applied to derivatives