$$\sum_{k=-\infty}^{\infty} \frac{\chi_{k-1}-\chi_k}{1/\alpha} \cdot \frac{\partial \Phi(\chi)}{\partial \chi_k}$$

$$= \alpha \sum_{n=1}^{\infty} \left\{ \frac{\partial F}{\partial a_n} [a_n \cos(\pi/n) - b_n \sin(\pi/n) - a_n] + \frac{\partial F}{\partial b_n} [b_n \cos(\pi/n) + a_n \sin(\pi/n) - b_n] \right\}$$

$$\frac{\partial}{\partial \chi_k} = \sum_{n=1}^{\infty} \left(\frac{\partial a_n}{\partial \chi_k} \cdot \frac{\partial}{\partial a_n} + \frac{\partial b_n}{\partial \chi_k} \cdot \frac{\partial}{\partial b_n} \right)$$

$$= \sum_{n=1}^{\infty} \left[\cos(k\pi/n) \frac{\partial}{\partial a_n} + \sin(k\pi/n) \frac{\partial}{\partial b_n} \right]$$

$$\sum_{k=-\infty}^{\infty} \left(\frac{\partial}{\partial \chi_k} \right)^2 = \sum_{n=1}^{\infty} \sum_{s=1}^{\infty} \sum_{k=-\infty}^{\infty} \left[\cos(k\pi/n) \cos(k\pi/s) \frac{\partial}{\partial a_n} \frac{\partial}{\partial a_s} + \sin(k\pi/n) \sin(k\pi/s) \frac{\partial}{\partial b_n} \frac{\partial}{\partial b_s} + \cos(k\pi/n) \sin(k\pi/s) \frac{\partial}{\partial a_n} \frac{\partial}{\partial b_s} + \sin(k\pi/n) \cos(k\pi/s) \frac{\partial}{\partial b_n} \frac{\partial}{\partial a_s} \right]$$