

## 1d periodic differential operator of order 4

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We consider a differential operator

$$L = \frac{d^4}{dx^4} + \frac{d}{dx}p(x)\frac{d}{dx} + q(x), x \in R^1$$

with 1-periodic functions  $p(x)$  and  $q(x)$ . We prove that the characteristic equation for its Floquet multipliers is inverse and hence its spectrum in  $L^2(R^1)$  may be described using some hyper-elliptic Riemann surface.

We prove the following uniqueness theorem:

Let  $U(\lambda)$  be the monodromy matrix of operator  $L$  and let its characteristic determinant  $\det(U(\lambda) - \rho I)$  be the same as of operator  $L_0 = \frac{d^4}{dx^4}$ . Then  $p(x) \equiv q(x) \equiv 0$ .