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Nonsingular finite-zone two-dimensional Schrödinger operators and Prymians of real curves.

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Funct. Anal. Appl. 22, No. 1, 68-70 (1988); translation from Funkts. Anal. Prilozh. 22, No. 1, 79-80 (1988).

Let P be a compact Riemann surface of genus 2g with two antiholomorphic involutions $\tau_i : P \to P$, the involution $\tau_1\tau_2$ having exactly two fixed points p_1, p_2 and $\tau_i p_1 = p_2$. Involutions τ_i induce involutions $\tilde{\tau}_i$ of the Prym variety $P_r = P_r(P, \tau_1\tau_2)$. Fixed points of $\tilde{\tau}_i$ break down into $n \leq 2^g$ q-dimensional tori. The torus T can be called acceptable if $\theta_{P_r}(z) \neq 0$ on T. According to *A. P. Veselov*'s and *S. P. Novikov*'s Theorem [Sov. Math., Dokl. 30, 588-591 resp. 705-708 (1984); translation from Dokl. Akad. Nauk SSSR 279, 20-24 resp. 784-788 (1984; Zbl 0613.35020 resp. Zbl 0602.35024)] the acceptable torus induces the family of nonsingular finite-zone two-dimensional Schrödinger operators. In the paper the description of acceptable tori is given. Involutions τ_i induce on the surface $P_0 = P/\tau_1\tau_2$ the antiholomorphic involution τ_0 with $k = k_1 + k_2$ ovals, where k_i is the number of ovals of the involutions τ_0, which are the image of ovals of the involutions τ_i.

Theorem. Among tori of fixed points of the involutions $\tilde{\tau}_i$ is not larger than one acceptable torus. This torus exists only in case $k = g + 1$ or $k_i \leq k_{2-i}$.

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