Growth of systoles along coverings

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[1] IMPA

We say that a sequence $(a_g)_{g\geq 2}$ is *systolic admissible* if there exist constants $b, d > 0$ such that $b \leq a_n \leq d\log(g)$. We show that if we fix a closed hyperbolic surface X of genus 2, then for any systolic admissible sequence (a_g) there exists a sequence of coverings $p_n : X_g \to X$ such that X_g has genus g and holds

$$\log(\text{systole}(X_g)) \asymp_{b,d,X} \log(a_g).$$