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Martin Bridgeman (bridgem@bc.edu), **Richard Canary*** (canary@umich.edu) and **François Labourie** (francois.labourie@math.unice.fr). *Simple length spectrum rigidity.*

It is well known that a discrete, faithful representation of a closed surface group into $\mathrm{PSL}(2, \mathbb{R})$ is determined, up to conjugacy in $\mathrm{PGL}(2, \mathbb{R})$, by the translation lengths of finitely many elements represented by simple closed curves. We will discuss generalizations of this result to the setting of quasifuchsian representations into $\mathrm{PSL}(2, \mathbb{C})$ and Hitchin representations into $\mathrm{PSL}(n, \mathbb{R})$. We will also discuss applications of our simple length rigidity results to the study of the pressure metric. (This is joint work with Martin Bridgeman and François Labourie) (Received September 18, 2016)