Abstract: Let $f : Y \rightarrow X$ be a branched $\mathbb{Z}/p\mathbb{Z}$-cover of smooth, projective, geometrically connected curves over a perfect field of characteristic $p \neq 0$. We investigate the relationship between the $a$-numbers of $Y$ and $X$ and the ramification of the map $f$. This is analogous to the relationship between the genus (respectively $p$-rank) of $Y$ and $X$ given the Riemann-Hurwitz (respectively Deuring–Shafarevich) formula. Except in special situations, the $a$-number of $Y$ is not determined by the $a$-number of $X$ and the ramification of the cover, so we instead give bounds on the $a$-number of $Y$. We provide examples showing our bounds are sharp. The bounds come from a detailed analysis of the kernel of the Cartier operator. This is joint work with Bryden Cais.

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Mathematics and Science Center: W201