k-canonical divisors through Brill-Noether special points

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Abstract. Inside the projectivized k-th Hodge bundle, we construct a collection of divisors obtained by imposing vanishing at a Brill-Noether special point. We compute the classes of the closures of such divisors in two ways, using incidence geometry and restrictions to various families, including pencils of curves on K3 surfaces and pencils of Du Val curves. We also show the extremality and rigidity of the closure of the incidence divisor consisting of smooth pointed curves together with a canonical or 2-canonical divisor passing through the marked point.