

**Cavalier, Vincent; Lehmann, Daniel**

**On the Poincaré inequality for one-dimensional foliations.** (English) Zbl 1097.32010  
Compos. Math. 142, No. 2, 529-540 (2006).

Authors' abstract: Let  $d$  be the degree of an algebraic one-dimensional foliation  $\mathcal{F}$  on the complex projective space  $\mathbb{P}_n$ . Let  $\Gamma$  be an algebraic solution of degree  $\delta$ , and geometrical genus  $g$ .

We prove, in particular, the inequality  $(d-1)\delta + 2 - 2g \geq \mathcal{B}(\Gamma)$ , where  $\mathcal{B}(\Gamma)$  denotes the total number of locally irreducible branches through singular points of  $\Gamma$  when  $\Gamma$  has singularities, and  $\mathcal{B}(\Gamma) = 1$  when  $\Gamma$  is smooth.

Equivalently, when  $\Gamma = \bigcap_{\lambda=1}^{n-1} S_\lambda$  is the complete intersection of  $n-1$  algebraic hypersurfaces  $S_\lambda$ , we get  $(d+n - \sum_{\lambda=1}^{n-1} \delta_\lambda)\delta \geq \mathcal{B}(\Gamma) - \mathcal{E}(\Gamma)$ , where  $\delta_\lambda$  denotes the degree of  $S_\lambda$  and  $\mathcal{E}(\Gamma) = 2 - 2g + (\sum_{\lambda=1}^{n-1} \delta_\lambda - (n+1))\delta$  the correction term in the genus formula. These results are also refined when  $\Gamma$  is reducible.

Reviewer: [Andrzej Piatkowski \(Łódź\)](#)

**MSC:**

- [32S65](#) Singularities of holomorphic vector fields and foliations
- [14M10](#) Complete intersections
- [19E20](#) Relations of  $K$ -theory with cohomology theories
- [32S20](#) Global theory of complex singularities; cohomological properties

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Cited in **6** Documents

**Keywords:**

degree of an algebraic foliation; Poincaré inequality; genus formula; GSV-index

**Full Text:** [DOI](#)