# BERNSTEIN TYPE INEQUALITIES ON SYSTEMS OF CIRCULAR ARCS

## Béla Nagy

*Bolyai Institute, University of Szeged, Hungary*
[nbela@math.u-szeged.hu]

Classical Bernstein inequality states that for any polynomial $P$ we have

$$|P'(t)| \leq \deg P \frac{1}{\sqrt{1-t^2}} ||P||$$

where $t \in (-1, 1)$ and $||P||$ denotes the sup-norm of $P$ over $[-1, 1]$.

In this talk, I discuss similar result on system of circular arcs. That is, $K \subset \mathbf{C}$ consists of finitely many circular arcs with common center at the origin. Then there exists $C > 0$ such that for all polynomial $P$ and for all $z \in K$, we have

$$|P'(z)| \leq C \deg(P)\, \omega_K(z)\, ||P||_K$$

where $\omega_K(z) = d\nu_K(z)/|dz|$ as above and $||P||_K$ denotes the sup-norm over $K$.

Finally, I relate it with some known results, e.g. [2] and [1].

### REFERENCES

[1] C. K. Kobindarajah, D. S. Lubinsky *Lp Markov-Bernstein Inequalities on All Arcs of the Circle*, Journal of Approximation Theory, 116(2002), pp. 343-368.

[2] B. Nagy, V. Totik *Sharpening of Hilbert's lemniscate theorem* , Journal d'Analyse Mathématique, 96(2005), pp. 191-223.