

Public Abstract  
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In this thesis we study different problems in Convex Geometry with the aid of the Fourier Transform and tools of Functional Analysis.

In the second chapter we construct an example of a non-intersection body all of whose central sections are intersection bodies.

The third chapter is devoted to the study of the geometry of  $L_0$ . We introduce the definition of embedding of a normed space in  $L_0$ , give a characterization of subspaces of  $L_0$  and confirm the place of  $L_0$  in the scale of  $L_p$  spaces.

In the fourth chapter we modify the assumptions of the original Busemann-Petty problem in order to obtain the positive answer in all dimensions.

Chapter five is focused on  $L_p$ -centroid bodies and generalization of some results of Lutwak and Grinberg, Zhang to  $-1 < p < 1$ .