# OSCILLATORY INTEGRALS AND NEWTON POLYHEDRA

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ABSTRACT. Let $\vec{P}$ be a vector polynomial of two variables. Given $I_j = [0,1]$ or $[0,\infty)$, we discuss about the largest number $\mu$ satisfying that

$$\int_{I_1 \times I_2} e^{i\langle \xi, \vec{P}(t) \rangle} \Psi(t_1, t_2) dt_1 dt_2 = O(|\xi|^{-\mu}) \text{ as } |\xi| \to \infty$$

for all $\Psi$ in a certain class of $C^\infty$ functions. Our results are described in terms of a generalized notion of Newton polyhedra associated with $\vec{P}$.

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