Sinusoidal Signal Approximation

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***Goal*—**find the global optimal points for approximating an electronic signal with respect to different phases .

***Convexity*—**this is not a convex problem because our objective function and constraint are not convex.

***Objective*—**try to minimize the function:

where .

***Solution*—**we plan to solve this problem using numeric methods on its Lagrange dual representation.

First we have the Lagrange dual representation:

Since is bounded, we can take partial derivative w.r.t. each parameters and calculate the solution. The derivative is as follows:



So we can have:

where .