

## **582b Global Optimization in Refinery Planning**

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Optimization based refinery planning models created by commercial systems are almost invariably non-linear. The non-linearities arise from several sources, including pooling of streams, non-linear process model characterization and non-linear blending equations. Such models sometimes exhibit local optima. The way in which this is usually determined is when a set of cases is solved with successively more restrictive constraints, and a more restrictive case converges to a higher objective function value than a less restrictive case. Over the years this has been a source of great frustration to refinery planners and has tended to diminish the credibility of optimization based refinery planning.

Over the past several years the authors have investigated, developed and successfully commercialized optimization technology for determining the global optimum of large scale non-linear refinery planning models and in the case of pooling problems, proving the global optimality of the solutions. The technology incorporates state-of-the-art deterministic methods based on convex relaxations as well as statistical multi-start methods into a unified framework.