This is a joint research project between Turkey (TUBITAK) and France (CNRS). The project involves research visits between the two countries.

Project Title: Reload cost concept in graph theory: A combinatorial analysis

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Project summary: Numerous real-world problems can be modelled using edge-colored graphs. The concept of reload cost refers to the cost that occurs while traversing a vertex via two consecutive edges of different colors. The reload cost depends on the colors of the incident traversed edges. This concept has important applications such as telecommunications, transportation networks, and energy distribution networks. For instance, each color can represent a mode of transportation in a cargo transportation network. The cost incurred while transferring from one mode to another corresponds to reload cost.

In this project, we will focus on four major research areas within the reload cost concept: minimum changeover cost arborescence problem, minimum reload cost cycle cover problem, minimum reload cost diameter problem, and minimum changeover cost edge coloring problem. We will investigate the complexity and approximability properties of these problems in special cases such as special graph classes, bounded degree, and bounded reload cost values. We will also investigate these problems in terms of parameterized complexity.