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16. Abstract <p>Current vehicle illumination systems are facing a number of problems, including inadequate visibility and driver discomfort. One of the main reasons for these problems is that the current systems are static, and thus not responsive to changing conditions and situations. Recent technological developments such as new light sources, advanced optical engineering, and advanced electronics and sensors have made it possible to begin developing a new generation of vehicle illumination systems that would be adaptive to changing characteristics of the traffic, roadway, vehicle, weather, and lighting conditions in night traffic.</p> <p>This study was designed to analyze the possibilities and limitations for designing a truly adaptive system. The report is speculative and optimistic in its nature. Several proposals are made, some based on research results, and some on personal experience and opinion. Consequently, this is not a traditional, formal research report. Rather, it is an effort to renew the discussion in an old area. Earlier efforts to design adaptive vehicle illumination systems are briefly reviewed.</p> <p>The primary variables to which an illumination system should adapt are discussed. Ideas about how these variables can be measured in real traffic are put forward. An effort is made to estimate the magnitude of the advantage of adaptive systems mainly in terms of visibility. Also, possible obstacles and expected time frames for the introduction of such systems are discussed. Economic and technical limitations are not covered.</p>					
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