Name of the Technology: Blue Button Laser Induced Yellow Phosphor for Highly-Efficient White Light Generation

Brief Summary: LARP (Laser Assisted Remote phosphors) is getting more and more challenging for automobile industries. Laser technology could be very interesting for more classical low beam and high beam solutions for automotive. The laser excited yellow phosphor which is Cerium (Ce) doped YAG phosphor has been developed and various geometries based on transmission and reflection modes have also been studied and it has been found that the phosphor has longevity of several thousand hours which is the edge of the studies done at CSIR-NPL.

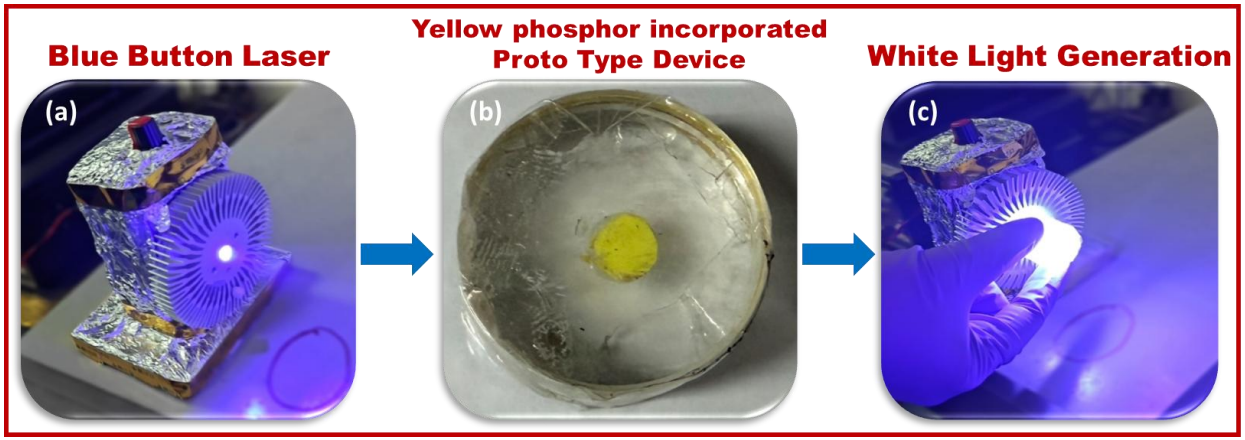

Figure 1: (a) Blue button laser source, (b) Prototype device of Yellow phosphor incorporated flexible layer sandwiched between two quartz plates, (c) White light generation by placing the prototype device in front of blue button laser.

In present technology, the new concept of blue button laser induced highly efficient white light generation has been achieved. To achieve this, a new design of yellow phosphor integrated in Polydimethylsiloxane (PDMS) layer with optimum thickness and sandwiched between two layers of quartz plates of ~3mm thickness in circular form has been fabricated. The illuminance of this proposed design will be almost three times higher than the InGaN-based blue LED-based headlights. This could be a better replacement of the existing headlights for high beam illuminance as compared to the existing one for better penetration for long distances to avoid accidents for automobiles on highways.

Applications: It can be used in automobile headlights for high beam illuminance as compared to the existing one for better penetration for long distances to avoid accidents for automobiles on highways. It could also be used in playgrounds' tunable lighting, to increase the aspect ratio of projectors, rail engine headlights as well as in bullet train headlights.

Novelty Features: LARP (Laser Assisted Remote phosphors) is getting more and more challenging for automobile industries and simultaneously very interesting for more classical low beam and high beam solutions also for automotive industries. The current technology has proposed the laser induced white light generation for the first time for automobiles as a replacement of LED based white light generation in India.

Advantages: The proposed technology could be beneficial for the headlights for high beam illuminance as compared to the existing one for better penetration for long distances.

Technology Readiness Level:

Idea	Concept Definition	Proof of Concept	Prototype	Lab Validation	Technology Development	Technology Demonstration	Technology Integrated	Market Launch

IPR Details:

CSIR-IPU NF Number: 0134NF2026
Indian Patent Title: A process of blue button laser induced yellow phosphor incorporated highly-efficient white light generation and thereof
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Broad Area / Category: Strategic Materials

User Industries: Automotive Industries, Lighting Industry