Conclusion

A TEA CO_2 laser preionized by UV radiation has been designed, constructed and operated successfully between 21-28 kV. Time delay of 1-4 μS between the preionization and the main discharge is sufficient for arc free discharge. However, at high voltage > 28 kV arc is frequent and large proportion of helium gas must be used. The discharge circuit has yet to be optimized for faster rise time in order to avoid arcing problem.

Suggestion for further research works

1. Improvement in arc free discharge by more efficient preionization and main discharge circuits.

2. Implementation of transverse gas flow with cooling by external heat excharger.

3. Miniaturization of the laser head for special application

Work in our different scheme of preionization is in progress.

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