## 26PB24 ON A POSSIBILITY OF THE TUNABLE VISIBLE DYE-FREE LASER ACTION.

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Nowadays dyes are usually used to obtain high power laser action in the visible region of spectrum. However, there are some problems in dye laser operation connected with their photochemical stability. The purpose of this paper is to suggest how to provide high power laser output without using dyes. The proposed laser system is based on discharge XeCl laser The pumping power density should exceed 1 MW per cubic centimeter, the pulse duration being about 100 ns (FWHM). These pumping conditions together with selecting appropriate gas mixture ( Ne-Xe-HCl=1000-50-1) are most suitable for achievement of wide output spectrum formation. We have created a mathematical model for laser spectrum formation including, unlike the previous ones, the X-state dynamics of XeCl molecules. This model enabled us to find the optimal conditions for lasing on different electronic-vibrational transitions of XeCl molecules. Besides the XeCl laser, the described laser system includes a hydrogen Raman cell to convert the laser wavelength into the visible ( second and third Stokes) through stimulated Raman scattering (SRS). The conditions of SRS are selected in such a way which makes it possible to get efficient conversion into so-called side-bands (the lines of SRS which are attributed with 12 and 2-3 vibrational transitions of the hydrogen molecules). If the laser output is sufficiently tunable the laser system can produce high power laser beam over the spectral range 300-550 nm thanks to the overlapping the Raman bands. Thus, the combination of a XeCl laser which is tunable over relatively wide spectral range and of a Raman cell producing a number of laser lines allows one to obtain high power tunable output which covers the spectral range from 300 to 550 nm.