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## Transition Radiation of Multicharged Ions in a Thin Plate

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The problem of the transition radiation of multicharged ions at the interface between two media and in a thin plate under the charge-exchange conditions has been solved. It has been shown that the processes of pickup (or loss) of electrons by accelerated multicharged ions at the interface between two media significantly increases the yield of transition radiation. To observe the effects associated with a change in the charge of ions in the medium, their velocity should not be much higher than the Bohr velocity. The existing technical possibilities allow such experiments. Our analysis shows that the processes of charge exchange of multicharged ions in the medium result in a significant increase in the yield of transition radiation [1]. This is physically due to the appearance of an additional contribution to the yield from radiation of electrons that are picked up or lost by the multicharged ion in the medium. According to the analysis, this contribution is similar to the contribution from instantaneously starting or stopping charges. Narrow maxima in backward X-ray radiation at angles close to  $\pi/2$  (the total external reflection) can be used to create new directional broadband sources of X-ray radiation. The revealed features of angular distributions can be suitable for designing detectors of charge distributions of multicharged ions.

### References

1. V.S. Malyshevskiy, G.V. Fomin, I.A. Ivanova, JETP, 122 (2016) 209.

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