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**Effective scattering of dipole molecules in quasi-one-dimensional waveguides** LIMING GUAN, XIAOLING CUI, Institute for Advanced Study, Tsinghua University, Beijing, China — We study the effective s-wave scattering between dipolar molecules confined in quasi-one-dimensional waveguides. In contrary to a general belief that the system is repulsively interacting when the dipole moment is perpendicular to the waveguide, we find the effective interaction will turn negative and also go through a sequence of scattering resonances as increasing the strength of dipole-dipole interactions(DDI). This is attributed to the interplay of higher transverse modes of the confinement, along which DDI shows attractive character. Unlike conventional confinement-induced-resonance with short-range s-wave interactions, here the DDI induced resonances are insensitive to the background s-wave scattering length determined by short-range potentials. Moreover, the DDI induced resonances are associated with large effective-range, which sensitively depends on the strength of DDI. These results are expected to be observable in future experiment of dipolar molecules under confinements.

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