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	abstract	Aims. Using the recently observed torsional AlfvÃ©n waves in solar prominences, we determine the ionisation state of the plasma by taking into account that AlfvÃ©n waves propagate in a partially ionised prominence plasma. We derive the evolutionary equation of waves and compare the analytical solutions to observations to determine the number density of neutrals. Methods. Using a single fluid plasma approximation, where the wave damping is provided by the Cowling resistivity, we study the temporal evolution of waves. By comparing the solution of equations with observational data (period, amplitude, propagation speed), we determined the value of the Cowling resistivity that led us to draw a conclusion on the amount of neutrals in the partially ionised plasma, a quantity that cannot be measured directly or indirectly. Results. Our results show that damped torsional AlfvÃ©n waves are an ideal diagnostic tool for the ionisation state of the plasma. Using a simple model, we find that at the observational temperature of torsional AlfvÃ©n waves, the number of neutrals, is of the order of 5 Ã— 10 10 cm âˆ’3 .	**abstract**	Using the recently observed torsional AlfvÃ©n waves in solar prominences, we determine the ionisation state of the plasma by taking into account that AlfvÃ©n waves propagate in a partially ionised prominence plasma. We derive the evolutionary equation of waves and compare the analytical solutions to observations to determine the number density of neutrals. Using a single fluid plasma approximation, where the wave damping is provided by the Cowling resistivity, we study the temporal evolution of waves. By comparing the solution of equations with observational data (period, amplitude, propagation speed), we determined the value of the Cowling resistivity that led us to draw a conclusion on the amount of neutrals in the partially ionised plasma, a quantity that cannot be measured directly or indirectly. Our results show that damped torsional AlfvÃ©n waves are an ideal diagnostic tool for the ionisation state of the plasma. Using a simple model, we find that at the observational temperature of torsional AlfvÃ©n waves, the number of neutrals is of the order of 5Ã—10^10 cm^-3.		
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