Title: Radiation in stellar winds. Resonance line formation in inhomogeneous hot star winds

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Abstract: To incorporate the three-dimensional (3-D) nature of stellar wind clumping into radiative transfer calculations, in this thesis a newly developed full 3-D Monte Carlo radiative transfer code for inhomogeneous expanding stellar winds is presented and used to investigate how different model parameters influence resonance line formation. Realistic 3-D models that describe the dense as well as the rarefied wind components are used to model the formation of resonance lines in a clumped stellar wind. Non-monotonic velocity fields are accounted for as well. It is shown that the 3-D density and velocity wind inhomogeneities have very strong impact on the resonance line formation. The models show that the line opacity is lower for a larger clump separation and shallower velocity gradients within the clumps. They also demonstrate that to obtain empirically correct mass-loss rates from UV resonance lines, wind clumping and its 3-D nature must be taken into account.