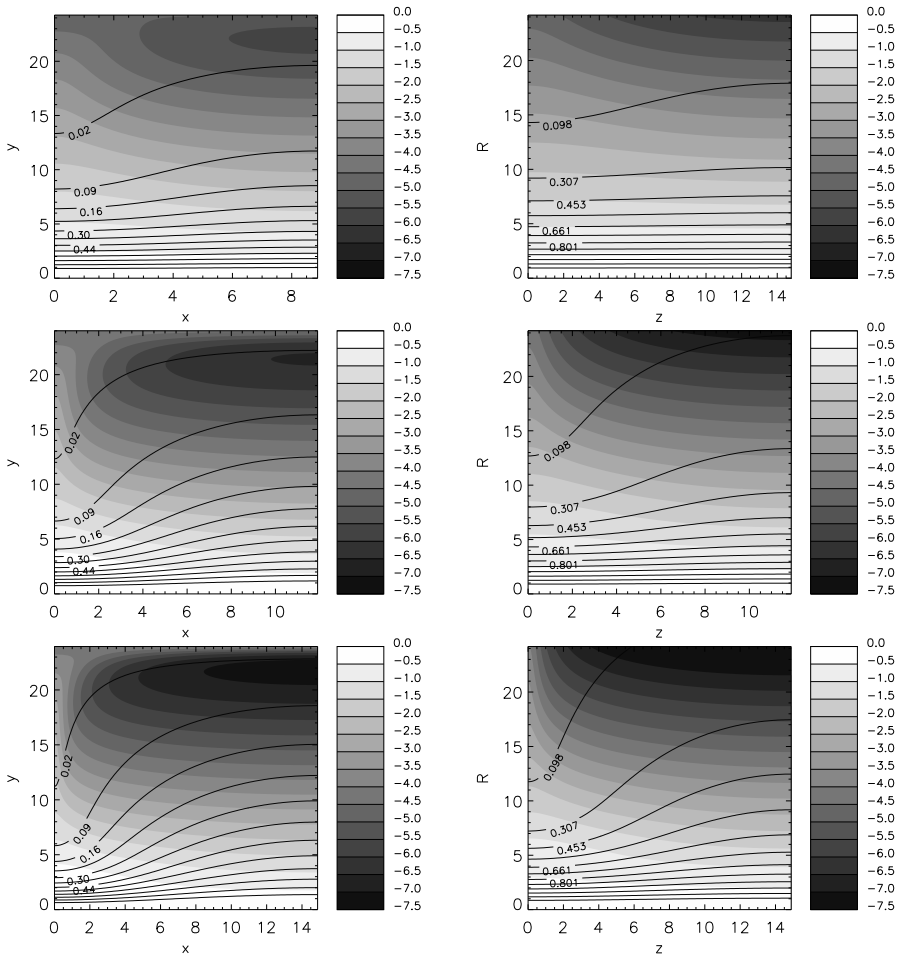

Fig. 6. Grayscale contour plots of the density and magnetic field lines (solid lines) for the Cartesian model (left) and the axisymmetric model (right), under constant gravity, for half the wavelength of 9, 12 and 15 in units of c_s^2/g (from top to bottom) and $\alpha = 1$. The bar gives the correlation between the grayscale and the natural logarithm of the density. The number on some curves is the value of A in the Cartesian model or the value of Φ in the axisymmetric model. To make the comparison of the deformation of the magnetic field lines easier, we plot the same magnetic lines in both models.

ometry of the problem. The plasma must slide down along the magnetic field lines until it reaches a new configuration of pressure equilibrium. The point is that, because of the radial convergence of the flow streamlines in the axisymmetrical model, we need less displacement of gas in the axisymmetric case than in the Cartesian model to achieve the same pressure gradient, as soon as the gas is isothermal, and, henceforth, less deformation of the magnetic field lines.

Since the separation between magnetic field lines in azimuthal sections do not reflect the magnetic strength in the axisymmetric case, it is illustrative to compare the magnetic pressure to make a fair comparison between the results in Cartesian and axial geometries (see Figure 9). Given a certain wavelength of the perturbation, the magnetic pressure maps depend on the geometry. Because of the stronger deformation in the Cartesian scenario, the magnetic pressure force and the magnetic stresses along the valleys of the magnetic field lines, i.e. at the cut $x = 0$, are larger than along $z = 0$. The distribution of magnetic pressure in the axial model with $\lambda_z/2 = 12$ is quite similar to the magnetic pressure configuration in the Cartesian case with $\lambda_x/2 = 9$.

The ratio of the magnetic to gas pressures is an indicator of the efficiency with which gas flows along field lines. As the increase of gas density in the magnetic field valleys is due primarily to the drainage along the field lines (see also M74), we expect that if the drainage is less efficient in the axisymmetri-