

1. SPHERICAL COORDINATES, III

Consider the sphere of radius r , in spherical coordinates (θ, ϕ) , with line element

$$ds^2 = r^2 (d\theta^2 + \sin^2 \theta d\phi^2)$$

- (a) Find the connection 1-forms ω_{ij} in this basis.
- (b) Compute $\Omega_{ij} = d\omega_{ij} + \omega_{ik} \wedge \omega_{kj}$ for $i, j = 1, 2$ (and where there is an implicit sum over k).
- (c) (Optional) Compare your answers (and your computations) with those from the previous homework assignment.